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TVAAGCPDQSPQLPWNPGHDQDHHVHIGQGKTLTSSATVYSIHISEGGKLVIKDHD
EPIVLRTRHILIDNGGELHAGSALCPFQGNFTIILYGRADEGIQPDPPYGLKYIGVGKG
GALELHGQKKLSWTFNLKTLHPGGMAEGGYFFERSWGHARGVIVHVIDPKSGTVIHSDF
DTYRSKKESERLVQYLNAVDPGRILSVAVNDEGSRLDDMARKAMTKLGSKHFLHLGFR
HPWSFLTIVKGNPSSSVEDHIEYHGHRGSAAARVFKLFQTEHGEYFNVSLSSSEWQDVEW
TEWFDHDKVSQTKGGEKISDLWKAHPGKICNRPIDIQATTMDGVNLSTEVVYKKGQDYR
FACYDRGRACRSYRVRFLCGKPVPRKLTVTIDTNVNSTILNLEDNVQSWKPGDTLVIAS
TDYSMYQAEEFQVLPCRSCAPNQVKVAGKPMYHIGEEIDGVDMAEVLGSLSRNIIVMG
EMEDKCYPRNHCNFFDFDTFGGHIKFALGFKAHLEGTELKHMGGQLVGGQYPIHFHL
AGDVDERGGYDPPTYIRDLSIHHTFSRCVTVHGSNGLLIKDVVGYNLGHCFETEDGPE
ERNTFDHCLGLLVKSGTLLPSDRDSKMCKMITEDSYPGYIPKPRQDCNAVSTFWMANPN
NNLINCAAAGSEETGFWFIFHHVPTGPSVGMYSYSEHPLGKFYNNRAHSNYRAGMI
IDNGVKTTEASAKDKRPFLSIIISARYSPHQDADPLKPREPAIRHFIAKYNQDHGAWLR
GGDVWLDSCRFAADNGIGLTLASGGTFPYDDGSKQEIKNLFLVGESGNVGTMMNDNRIWG
PGGLDHSGRTLPIGQNFPIRGIQLYDGPINIQNCTFRKFVALEGRHTSALAFLNNAWQ
SCPHNNVTGIAFEDVPITSRVFFGEPGPWFNQLDMDGDKTSVFHDVDGSVSEYPGSYLT
KNDNWLVRHPDCINVPDWRGAICSGCYAQMYIQAYKTSNLRMKIKNDFPSHPLYLEGA
LTRSTHYQQYQPVVTLQKGYTIHWDQTAPAEALIWLINFNKGDWIRVGLCYPRGTTFSI
LSDVHNRLKQTSKTGVFVRTLQMDKVEQSYPGRSHYYWDEDSGLLFLKLKAQNERKEF
AFCSMKGCERIKIKALIPKNAGVSDCTATAYPKFTERAVVDVPMPPKLFSGSQLKTKDHF
LEVKMESSKQHFFHLWNDFAFIEVDGKKYPSSSEDGIQVVVIDGNQGRVVSHTSFRNSIL
QGI PWQLFNYVATIPDNSIVLMASKGRYVSRGPWTRVLEKLGADRGLKLKEQMAFVGFK
GSFRPIWVTLDTEDEHKAKIFQVVPIPVVKKKKL

Fig. 1A

Amino acid sequence of secreted ColoUp1 protein (I)
(SEQ ID NO: 1)

AGCPDQSPQLQPNPQHDQDHHVHIGQGKTLTLLTSSATVYSIHISEGGKLVIKDHDEPI
 VLRTRHILIDNGGELHAGSALCPFQGNFTIILYGRADEGIQPDPPYGLKYIGVGKGGAL
 ELHGQKKLSWTFNLKTLHPGMAEGGYFFERSWGHARGVIVHVIDPKSGTVIHSDRFDTY
 RSKKESERLVQYLNAPVDGRILSVAVNDEGSRNLDDMARKAMTKLGSKHFLHLGFRHPW
 SFLTVKGNPSSSVEDHIEYHGHRGSAAARVFKLFQTEHGEYFNVSLSSEWVQDVEWTEW
 FDHDKVSQTKGGEKISDLWKAHPGKICNRPIDIQATTMDGVNLSTEVVYKKGQDYRFAC
 YDRGRACRSYRVRFCLCGKPVRPKLTVTIDTNVNSTILNLEDNVQSWKPGDTLVIASDY
 SMYQAEFQVLPCRSCAPNQVKVAGKPMYLIHIGEEIDGVDMAEVGLLSRNIIVMGEME
 DKCYPYRNHICNFFDFTFGGHIKFALGFKAHLEGTELKHMGGQQLVGQYPIHFHLAGD
 VDERGGYDPPTYIRDLSIHHTFSRCVTVHGSNGLLIKDVVGYNLSLGHCFFTEDGPEERN
 TFDHCLGLLVKSGTLLPSDRDSKMCKMITEDSYPGYIPKPRQDCNAVSTFWMANPNNNL
 INCAAAGSEETGFWFIFHHVPTGPSVGMYSYSEHPLGKFYNNRAHSNYRAGMIIDN
 GVKTTTEASAKDKRPFLSIISARYSPHQDADPLKPREPAIRHFIAAYKNQDHGAWLRGGD
 VWLDSRCFADNGIGLTLASGGTFPYDDGSKQEIKNSLFVGESGNVGTMMMDNRIWGPGG
 LDHSGRTLPIGQNFPIRGIQLYDGPINIQNCTFRKFVALEGRHTSALAFLNNAWQSCP
 HNNVTGIAFEDVPITSRVFFGEPGPWFNQLDMDGDKTSVFHDVDGSVSEYPGSYLTKND
 NWLVRHPDCINVPDWRGAICSGCYAQMYIQAYKTSNLRMKIKNDFPSHPLYLEGALTR
 STHYQQYQPVVTLQKGYTIHWDQTAPAEALAIWLINFNKGDWIRVGLCYPRGTTFSILSD
 VHNRLKQTSKTGVFVRTLQMDKVEQSYPGRSHYYWDEDSGLLFLKLKAQNEREKFAFC
 SMKGCERIKIKALIPKNAGVSDCTATAYPKFTERAVVDVPMKKLFGSQLKTKDHFLEV
 KMESSKQHFFHLWNDFAYIEVDGKKYPSSSEDGIQVVVIDGNQGRVVSHTSFRNSILQGI
 PWQLFNYVATIPDNSIVLMASKGRYVSRGPWTRVLEKLGAADRGLKLKEQMAFVGFKGSF
 RPIWVTLDTEDHKAKIFQVVPPIPVVKKKKL

Fig. 1B

Amino acid sequence of secreted ColoUp1 protein (II)
 (SEQ ID NO: 2)

LQEVHVSKETIGKISAASKMMWCSAAVDIMFLLDGSNSVGKGSFERSKHFAITVCDGLD
ISPERVRVGAFQFSSTPHLEFPLDSFSTQQEVKARIKRMVFKGGRTETELALKYLLHRG
LPGGRNASVPQILIIIVTDGKSQGDVALPSKQLKERGVTVFAVGVRFPWRWELHALASEP
RGQHVLLAEQVEDATNGLFSTLSSSAICSSATPDCRVEAHPCEHRTLEMVREFAGNAPC
WRGSRRTLAVLAAHCPFYSWKRVFLTHPATCYRTTCPGPCDSQPCQNGGTCVPEGLDGY
QCLCPLAFGGEANCALKLSLECRVDLLFLLDSSAGTTLDGFLRAKVFKRFVRAVLSED
SRARVGVATYSRELLVAVPVGEYQDVPDLVWSLDGIPFRGGPTLTGSALRQAAERGFGS
ATRTGQDRPRRVVLLTESHSEDEVAGPARHARARELLLLGVGSEAVRAELEETGSPK
HVMVYSDPDLEFNQIPELQGKLCSRQRPQCRTQALDLVFMLDTSASVGPENFAQMOSFV
RSCALQFEVNPDVTQVGLVVYGSQVQTAFGLDTKPTRAAMLRAISQAPYLGGVGSAGTA
LLHIYDKVMTVQRGARPGVPKAVVVLTGGRGAEDAAVPAQKLNNNGISVLVVGVPVLS
EGLRRLAGPRDSLIVHVAAYADLRYHQDVLI EWLCGEAKQPVNLCCKPSPCMNEGSCVLQN
GSYRCKCRDGWEGPHCENRFLRRP

Fig. 2
Amino acid sequence of secreted ColoUp2 protein
(SEQ ID NO: 3)

CGTGACACTGTCTCGGCTACAGACCCAGAGGGAGCACACTGCCAGGATGGGAGCTGCTG
 GGAGGCAGGACTTCCTCTTCAAGGCCATGCTGACCATCAGCTGGCTCACTCTGACCTGC
 TTCCCTGGGGCCACATCCACAGTGGCTGCTGGGTGCCCTGACCAGAGCCCTGAGTTGCA
 ACCCTGGAACCCTGGCCATGACCAAGACCACCATGTGCATATCGGCCAGGGCAAGACAC
 TGCTGCTCACCTCTTCTGCCACGGTCTATTCCATCCACATCTCAGAGGGAGGCAAGCTG
 GTCATTAAAGACCACGACGAGCCGATTGTTTTTGCGAACCCGGCACATCCTGATTGACAA
 CGGAGGAGAGCTGCATGCTGGGAGTGCCCTCTGCCCTTTCCAGGGCAATTTACCATCA
 TTTTGTATGGAAGGGCTGATGAAGGTATTAGCCGGATCCTTACTATGGTCTGAAGTAC
 ATTGGGGTTGGTAAAGGAGGCGCTCTTGAGTTGCATGGACAGAAAAAGCTCTCCTGGAC
 ATTTCTGAACAAGACCCTTCAACCAGGTGGCATGGCAGAAGGAGGCTATTTTTTTTGAAA
 GGAGCTGGGGCCACCGTGGAGTTATTGTTTATGTCATCGACCCCAATCAGGCACAGTC
 ATCCATTCTGACCGGTTTGACACCTATAGATCCAAGAAAGAGAGTGAACGTCTGGTCCA
 GTATTTGAACGCGGTGCCCGATGGCAGGATCCTTTCTGTTGCAGTGAATGATGAAGGTT
 CTCGAAATCTGGATGACATGGCCAGGAAGGCGATGACCAATTGGGAAGCAAACACTTC
 CTGCACCTTGGATTAGACACCCCTTGGAGTTTTCTAACTGTGAAAGGAAATCCATCATC
 TTCAGTGGAAGACCATATTGAATATCATGGACATCGAGGCTCTGCTGCTGCCCGGGTAT
 TCAAATTGTTCCAGACAGAGCATGGCGAATATTTCAATGTTTCTTTGTCCAGTGAGTGG
 GTTCAAGACGTGGAGTGGACGGAGTGGTTCGATCATGATAAAGTATCTCAGACTAAAGG
 TGGGGAGAAAATTTAGACCTCTGGAAAGCTCACCCAGGAAAAATATGCAATCGTCCCA
 TTGATATACAGGCCACTACAATGGATGGAGTTAACCTCAGCACCGAGGTTGTCTACAAA
 AAAGGCCAGGATTATAGGTTTGCTTGCTACGACCGGGGCAGAGCCTGCCGGAGCTACCG
 TGTACGGTTTCTCTGTGGGAAGCCTGTGAGGCCCAAACCTCACAGTCACCATTGACACCA
 ATGTGAACAGCACCATTCTGAACCTGGAGGATAATGTACAGTCATGGAAACCTGGAGAT
 ACCCTGGTCATTGCCAGTACTGATTACTCCATGTACCAGGCAGAAGAGTTCCAGGTGCT
 TCCCTGCAGATCCTGCGCCCCCAACCAGGTCAAAGTGGCAGGGAAACCAATGTACCTGC
 ACATCGGGGAGGAGATAGACGGCGTGGACATGCGGGCGGAGGTGGGGCTTCTGAGCCGG
 AACATCATAGTGATGGGGGAGATGGAGGACAAATGCTACCCCTACAGAAACCATCTG
 CAATTTCTTTGACTTCGATACCTTTGGGGGCCACATCAAGTTTGCTCTGGGATTTAAGG
 CAGCACACTTGGAGGGCACGGAGCTGAAGCATATGGGACAGCAGCTGGTGGGTGAGTAC
 CCGATTCACTTCCACCTGGCCGGTGATGTAGACGAAAGGGGAGGTTATGACCCACCCAC
 ATACATCAGGGACCTCTCCATCCATCATACTCTCTCGCTGCGTCACAGTCCATGGCT
 CCAATGGCTTGTTGATCAAGGACGTTGTGGGCTATAACTCTTTGGGCCACTGCTTCTTC
 ACGGAAGATGGGCCGGAGGAACGCAACACTTTTGACCACTGTCTTGGCCTCCTTGTCAA
 GTCTGGAACCCTCCTCCCCTCGGACCGTGACAGCAAGATGTGCAAGATGATCACAGAGG
 ACTCCTACCCAGGGTACATCCCCAAGCCCAGGCAAGACTGCAATGCTGTGTCCACCTTC
 TGGATGGCCAATCCCAACAACAACCTCATCAACTGTGCCGCTGCAGGATCTGAGGAAAC
 TGGATTTTGGTTTATTTTTTACCACGTACCAACGGGGCCCCTCCGTGGGAATGTACTCCC
 CAGGTTATTAGAGCACATTCCACTGGGAAAATTCTATAACAACCGAGCACATTCCAAC
 TACCGGGCTGGCATGATCATAGACAACGGAGTCAAAACCACCGAGGCCTCTGCCAAGGA
 CAAGCGGCCGTTTCTCTCAATCATCTCTGCCAGATACAGCCCTCACCAGGACGCCGACC
 CGCTGAAGCCCCGGGAGCCGGCCATCATCAGACACTTCATTGCCTACAAGAACCAGGAC
 CACGGGGCCTGGCTGCGCGGCGGGGATGTGTGGCTGGACAGCTGCCGGTTTGTGACAA
 TGGCATTTGGCCTGACCCTGGCCAGTGGTGGAAACCTTCCCGTATGACGACGGCTCCAAGC
 AAGAGATAAAGAACAGCTTGTTTGTGGCGAGAGTGGCAACGTGGGGACGGAAATGATG
 GACAATAGGATCTGGGGCCCTGGCGGCTTGGACCATAGCGGAAGGACCCTCCCTATAGG

Fig. 3
 Nucleic acid sequence of ColoUp1
 (SEQ ID NO: 4)

CCAGAATTTTCCAATTAGAGGAATTCAGTTATATGATGGCCCCATCAACATCCAAAAC
 GCACTTTCCGAAAGTTTGTGGCCCTGGAGGGCCGGCACACCAGCGCCCTGGCCTTCCGC
 CTGAATAATGCCTGGCAGAGCTGCCCCCATAACAACGTGACCGGCATTGCCTTTGAGGA
 CGTTCCGATTACTTCCAGAGTGTTCTTCGGAGAGCCTGGGCCCTGGTTCAACCAGCTGG
 ACATGGATGGGGATAAGACATCTGTGTTCCATGACGTCGACGGCTCCGTGTCCGAGTAC
 CCTGGCTCCTACCTCACGAAGAATGACAACCTGGCTGGTCCGGCACCCAGACTGCATCAA
 TGTTCCTCGACTGGAGAGGGGCCATTTGCAGTGGGTGCTATGCACAGATGTACATTCAAG
 CCTACAAGACCAGTAACCTGCGAATGAAGATCATCAAGAATGACTTCCCCAGCCACCTT
 CTTTACCTGGAGGGGGCGCTCACCAGGAGCACCCATTACCAGCAATACCAACCGGTTGT
 CACCCTGCAGAAAGGGCTACACCATCCACTGGGACCAGACGGCCCCCGCGAACTCGCCA
 TCTGGCTCATCAACTTCAACAAGGGCGACTGGATCCGAGTGGGGCTCTGCTACCCGCGA
 GGCACCACATTCTCCATCCTCTCGGATGTTTCACAATCGCTGCTGAAGCAAACGTCCAA
 GACGGGCGTCTTCGTGAGGACCTTGCGAGATGGACAAAGTGGAGCAGAGCTACCCTGGCA
 GGAGCCACTACTACTGGGACGAGGACTCAGGGCTGTTGTTTCTGAAGCTGAAAGCTCAG
 AACGAGAGAGAGAAGTTTGCTTTCTGCTCCATGAAAGGCTGTGAGAGGATAAAGATTAA
 AGCTCTGATTCCAAAGAACGCAGGCGTCAGTGACTGCACAGCCACAGCTTACCCCAAGT
 TCACCGAGAGGGCTGTCGTAGACGTGCCGATGCCCAAGAAGCTCTTTGGTTCTCAGCTG
 AAAACAAAGGACCATTCTTGGAGGTGAAGATGGAGAGTTCCAAGCAGCACTTCTTCCA
 CCTCTGGAACGACTTCGCTTACATTGAAGTGGATGGGAAGAAGTACCCAGTTCGGAGG
 ATGGCATCCAGGTGGTGGTGATTGACGGGAACCAAGGGCGCGTGGTGAGCCACACGAGC
 TTCAGGAACTCCATTCTGCAAGGCATACCATGGCAGCTTTTCAACTATGTGGCGACCAT
 CCCTGACAATTCCATAGTGCTTATGGCATCAAAGGGAAGATACGTCTCCAGAGGCCCAT
 GGACCAGAGTGCTGGAAAAGCTTGGGGCAGACAGGGGTCTCAAGTTGAAAGAGCAAATG
 GCATTTCGTTGGCTTCAAAGGCAGCTTCCGGCCCATCTGGGTGACACTGGACACTGAGGA
 TCACAAAGCCAAAATCTTCCAAGTTGTGCCCATCCCTGTGGTGAAGAAGAAGAAGTTGT
GAGGACAGCTGCCGCCCGGTGCCACCTCGTGGTAGACTATG

Fig. 3 continued.
 Nucleic acid sequence of ColoUp1
 (SEQ ID NO: 4)

GCCCCCTGGCCCGAGCCGCGCCCGGGTCTGTGAGTAGAGCCGCCCCGGGCACCGAGCGCT
 GGTGCGCGCTCTCCTTCCGTTATATCAACATGCCCCCTTTCCTGTTGCTGGAAGCCGTC
 TGTGTTTTCTGTTTTCCAGAGTGCCCCCATCTCTCCCTCTCCAGGAAGTCCATGTAAG
 CAAAGAAACCATCGGGAAGATTTTCACTGCGCAGCAAAATGATGTGGTGCTCGGCTGCAG
 TGGACATCATGTTTTCTGTTAGATGGGTCTAACAGCGTCGGGAAAGGGAGCTTTGAAAGG
 TCCAAGCACTTTGCCATCACAGTCTGTGACGGTCTGGACATCAGCCCCGAGAGGGTCAG
 AGTGGGAGCATTCAGTTTCACTTCCCTCATCTGGAATTTCCCTTGGATTCATTTT
 CAACCAACAGGAAGTGAAGGCAAGAATCAAGAGGATGGTTTTTCAAAGGAGGGCGCACG
 GAGACGGAACCTTGCTCTGAAATACCTTCTGCACAGAGGGTTGCCTGGAGGCAGAAATGC
 TTCTGTGCCCCAGATCCTCATCATCGTCACTGATGGGAAGTCCCAGGGGGATGTGGCAC
 TGCCATCCAAGCAGCTGAAGGAAAGGGGTGTCACTGTGTTTGTGTGGGGGTGAGGTTT
 CCCAGGTGGGAGGAGCTGCATGCACTGGCCAGCGAGCCTAGAGGGCAGCACGTGCTGTT
 GGCTGAGCAGGTGGAGGATGCCACCAACGGCCTCTTCAGCACCTCAGCAGCTCGGCCA
 TCTGCTCCAGCGCCACGCCAGACTGCAGGGTCGAGGCTCACCCCTGTGAGCACAGGACG
 CTGGAGATGGTCCGGGAGTTTCGCTGGCAATGCCCCATGCTGGAGAGGATCGCGGCGGAC
 CCTTGCGGTGCTGGCTGCACACTGTCCCTTCTACAGCTGGAAGAGAGTGTTCCTAACCC
 ACCCTGCCACCTGCTACAGGACCACCTGCCCAGGCCCCCTGTGACTCGCAGCCCTGCCAG
 AATGGAGGCACATGTGTTCCAGAAGGACTGGACGGCTACCAAGTGCCTCTGCCCCGCTGGC
 CTTTGGAGGGGAGGCTAACTGTGCCCTGAAGCTGAGCCTGGAATGCAGGGTCGACCTCC
 TCTTCTGCTGGACAGCTCTGCGGGCACCCTCTGGACGGCTTCTGCGGGCCAAAGTC
 TTCGTGAAGCGGTTTTGTGCGGGCCGTGCTGAGCGAGGACTCTCGGGCCCGAGTGGGTGT
 GGCCACATACAGCAGGGAGCTGCTGGTGGCGGTGCTGTGGGGGAGTACCAGGATGTGC
 CTGACCTGGTCTGGAGCCTCGATGGCATTCCCTTCCGTGGTGGCCCCACCCTGACGGGC
 AGTGCCTTGCGGCAGGCGGCAGAGCGTGGCTTCGGGAGCGCCACCAGGACAGGCCAGGA
 CCGGCCACGTAGAGTGGTGGTTTTGCTCACTGAGTCACACTCCGAGGATGAGGTTGCGG
 GCCAGCGCGTCACGCAAGGGCGCGAGAGCTGCTCCTGCTGGGTGTAGGCAGTGAGGCC
 GTGCGGGCAGAGCTGGAGGAGATCACAGGCAGCCCAAAGCATGTGATGGTCTACTCGGA
 TCCTCAGGATCTGTTCAACCAATCCCTGAGCTGCAGGGGAAGCTGTGCAGCCGGCAGC
 GGCCAGGGTGCCGGACACAAGCCCTGGACCTCGTCTTCATGTTGGACACCTCTGCCTCA
 GTAGGGCCCGAGAATTTTGCTCAGATGCAGAGCTTTGTGAGAAGCTGTGCCCTCCAGTT
 TGAGGTGAACCTGACGTGACACAGGTGCGCCTGGTGGTGTATGGCAGCCAGGTGCAGA
 CTGCCTTCGGGCTGGACACCAAAACCCACCCGGGCTGCGATGCTGCGGGCCATTAGCCAG
 GCCCCCTACCTAGGTGGGGTGGGCTCAGCCGGCACCGCCCTGCTGCACATCTATGACAA
 AGTGATGACCGTCCAGAGGGGTGCCCGGCCTGGTGTCCCCAAAGCTGTGGTGGTGTCA
 CAGGCGGGAGAGGCGCAGAGGATGCAGCCGTTCTGCCCCAGAAGCTGAGGAACAATGGC
 ATCTCTGTCTTGGTCTGCGGCGTGGGGCCTGTCTAAGTGAGGGTCTGCGGAGGCTTGC
 AGGTCCCCGGGATTCCCTGATCCACGTGGCAGCTTACGCCGACCTGCGGTACCACCAGG
 ACGTGCTCATTGAGTGGCTGTGTGGAGAAGCCAAGCAGCCAGTCAACCTCTGCAAACCC
 AGCCCGTGATGAATGAGGGCAGCTGCGTCTGCGAGAATGGGAGCTACCGCTGCAAGTG
 TCGGGATGGCTGGGAGGGCCCCCACTGCGAGAACCGATTCTTGAGACGCCCTTGAGGCA
 CATGGCTCCCGTGACAGGAGGGCAGCAGCCGTACCCCTCCCAGCAACTACAGAGAAGGCC
 TGGGCACTGAAATGGTGCCTACCTTCTGGAATGTCTGTGCCCCAGGTCTTAGAATGTC
 TGCTTCCCCGCGTGGCCAGGACCACTATTCTCACTGAGGGAGGAGGATGTCCCAACTGC
 AGCCATGCTGCTTAGAGACAAGAAAGCAGCTGATGTCAACCACAAACGATGTTGTTGAA
 AAGTTTTGATGTGTAAGTAAATACCACTTTCTGTACCTGCTGTGCCTTGTGAGGCTA

Fig. 4

Nucleic acid sequence of ColoUp2
 (SEQ ID NO: 5)

TGTCATCTGCCACCTTTCCCTTGAGGATAAACAAGGGGTCCTGAAGACTTAAATTTAGC
GGCCTGACG TTCCTTTGCACACAATCAATGCTCGCCAGAATGTTGTTGACACAGTAATG
CCCAGCAGAGGCCTTTACTAGAGCATCCTTTGGACGG

Fig. 4 continued.
Nucleic acid sequence of ColoUp2
(SEQ ID NO: 5)

GCAGAGCACAGCATCGTCTGGGACCAGACTCGTCTCAGGCCAGTTGCAGCCTTCTCAGCC
 AAACGCCGACCAAGGAAAACTCACTACCATGAGAAATTGCAGTGATTTGCTTTTGCCCTCC
 TAGGCATCACCTGTGCCATACCAGTTAAACAGGCTGATTCTGGAAGTTCTGAGGAAAAG
 CAGCTTTACAACAAATACCCAGATGCTGTGGCCACATGGCTAAACCCTGACCCATCTCA
 GAAGCAGAATCTCCTAGCCCCACAGACCCTTCCAAGTAAGTCCAACGAAAGCCATGACC
 ACATGGATGATATGGATGATGAAGATGATGATGACCATGTGGACAGCCAGGACTCCATT
 GACTCGAACGACTCTGATGATGTAGATGACACTGATGATTCTCACCAGTCTGATGAGTC
 TCACCATTCTGATGAATCTGATGAACTGGTCACTGATTTTCCCACGGACCTGCCAGCAA
 CCGAAGTTTTCACTCCAGTTGTCCCCACAGTAGACACATATGATGGCCGAGGTGATAGT
 GTGGTTTATGGACTGAGGTCAAAATCTAAGAAGTTTCGCAGACCTGACATCCAGTACCC
 TGATGCTACAGACGAGGACATCACCTCACACATGGAAAGCGAGGAGTTGAATGGTGCAT
 ACAAGGCCATCCCCGTTGCCCAGGACCTGAACGCGCCTTCTGATTGGGACAGCCGTGGG
 AAGGACAGTTATGAAACGAGTCAGCTGGATGACCAGAGTGCTGAAACCCACAGCCACAA
 GCAGTCCAGATTATATAAGCGGAAAGCCAATGATGAGAGCAATGAGCATTCCGATGTGA
 TTGATAGTCAGGAACTTTCCAAAGTCAGCCGTGAATTCCACAGCCATGAATTTACAGC
 CATGAAGATATGCTGGTTGTAGACCCCAAAGTAAGGAAGAAGATAAACACCTGAAATT
 TCGTATTTCTCATGAATTAGATAGTGCATCTTCTGAGGTCAATTAAAGGAGAAAAAAT
 ACAATTTCTCACTTTGCATTTAGTCAAAAGAAAAAATGCTTTATAGCAAAATGAAAGAG
 AACATGAAATGCTTCTTCTCAGTTTATTGGTTGAATGTGTATCTATTTGAGTCTGGAA
 ATAACATAATGTGTTTGATAATTAGTTTAGTTTGTGGCTTCATGGAACTCCCTGTAAAC
 TAAAAGCTTCAGGGTTATGTCTATGTTCACTCTATAGAAGAAATGCAAACATCACTGT
 ATTTTAATATTTGTTATTCTCTCATGAATAGAAATTTATGTAGAAGCAAACAAAATACT
 TTTACCCACTTAAAAAGAGAATATAACATTTTATGTCACTATAATCTTTTGTTTTTTAA
 GTTAGTGTATATTTGTTGTGATTATCTTTTGTGGTGTGAATAAATCTTTTATCTTGA
 ATGTAATAAGAATTTGGTGGTGTCAATTGCTTATTTGTTTTTCCCACGGTTGTCCAGCAA
 TTAATAAACATAACCTTTTTTACTGCCTAAAAA

Fig. 5
 Nucleic acid sequence of Osteopontin
 (SEQ ID NO: 6)

AAAGGGGCAAGAGCTGAGCGGAACACCGGCCCGTCGCGGCAGCTGCTTCACCCCTC
 TCTCTGCAGCCATGGGGCTCCCTCGTGGACCTCTCGCGTCTCTCCTCCTTCTCCAGGTT
 TGCTGGCTGCAGTGCGCGGCCTCCGAGCCGTGCCGGGCGGTCTTCAGGGAGGCTGAAGT
 GACCTTGAGGGCGGGAGGCGCGGAGCAGGAGCCCGGCCAGGCGCTGGGGAAAGTATTCA
 TGGGCTGCCCTGGGCAAGAGCCAGCTCTGTTTAGCACTGATAATGATGACTTCACTGTG
 CGGAATGGCGAGACAGTCCAGGAAAGAAGGTCACTGAAGGAAAGGAATCCATTGAAGAT
 CTTCCCATCCAAACGTATCTTACGAAGACACAAGAGAGATTGGGTGGTTGCTCCAATAT
 CTGTCCCTGAAAATGGCAAGGGTCCCTTCCCCCAGAGACTGAATCAGCTCAAGTCTAAT
 AAAGATAGAGACACCAAGATTTTCTACAGCATCACGGGGCCGGGGGCAGACAGCCCCC
 TGAGGGTGTCTTCGCTGTAGAGAAGGAGACAGGCTGGTTGTTGTTGAATAAGCCACTGG
 ACCGGGAGGAGATTGCCAAGTATGAGCTCTTTGGCCACGCTGTGTGTCAGAGAATGGTGCC
 TCAGTGGAGGACCCCATGAACATCTCCATCATCGTGACCGACCAGAATGACCACAAGCC
 CAAGTTTACCCAGGACACCTTCCGAGGGAGTGTCTTAGAGGGAGTCTTACCAGGTACTT
 CTGTGATGCAGGTGACAGCCACGGATGAGGATGATGCCATCTACACCTACAATGGGGTG
 GTTGCTTACTCCATCCATAGCCAAGAACCAAAGGACCCACACGACCTCATGTTACCAT
 TCACCGGAGCACAGGCACCATCAGCGTCATCTCCAGTGGCCTGGACCGGGAAAAAGTCC
 CTGAGTACACACTGACCATCCAGGCCACAGACATGGATGGGGACGGCTCCACCACCACG
 GCAGTGGCAGTAGTGGAGATCCTTGATGCCAATGACAATGCTCCCATGTTTGACCCCCA
 GAAGTACGAGGCCCATGTGCCTGAGAATGCAGTGGGCCATGAGGTGCAGAGGCTGACGG
 TCACTGATCTGGACGCCCCCAACTCACCAGCGTGGCGTGCCACCTACCTTATCATGGGC
 GGTGACGACGGGGACCATTTTACCATCACCACCCACCCTGAGAGCAACCAGGGCATCCT
 GACAACCAGGAAGGGTTTGGATTTTGGAGGCCAAAAACCAGCACACCCTGTACGTTGAAG
 TGACCAACGAGGCCCTTTTGTGCTGAAGCTCCCAACCTCCACAGCCACCATAGTGGTC
 CACGTGGAGGATGTGAATGAGGCACCTGTGTTTGTCCACCCTCCAAAGTCGTTGAGGT
 CCAGGAGGGCATCCCCACTGGGGAGCCTGTGTGTGTCTACACTGCAGAAGACCCTGACA
 AGGAGAATCAAAAGATCAGCTACCGCATCCTGAGAGACCCAGCAGGGTGGCTAGCCATG
 GACCCAGACAGTGGGCAGGTCAAGCTGTGGGCACCTCGACCGTGAGGATGAGCAGTT
 TGTGAGGAACAACATCTATGAAGTCATGGTCTTGGCCATGGACAATGGAAGCCCTCCCA
 CCACTGGCACGGGAACCCTTCTGCTAACACTGATTGATGTCAATGACCATGGCCCAGTC
 CCTGAGCCCCGTGAGATCACCATCTGCAACCAAGCCCTGTGCGCCAGGTGCTGAACAT
 CACGGACAAGGACCTGTCTCCCCACACCTCCCCTTTCCAGGCCAGCTCACAGATGACT
 CAGACATCTACTGGACGGCAGAGGTCAACGAGGAAGGTGACACAGTGGTCTTGTCCCTG
 AAGAAGTTCCTGAAGCAGGATACATATGACGTGCACCTTTCTCTGTCTGACCATGGCAA
 CAAAGAGCAGCTGACGGTGATCAGGGCCACTGTGTGCGACTGCCATGGCCATGTCGAAA
 CCTGCCCTGGACCCTGGAAGGGAGGTTTCATCCTCCCTGTGCTGGGGGCTGTCCTGGCT
 CTGCTGTTCTCCTGCTGGTGCTGCTTTTGTGTTGGTGAGAAAGAAGCGGAAGATCAAGGA
 GCCCCTCCTACTCCAGAAGATGACACCCGTGACAACGTCTTCTACTATGGCGAAGAGG
 GGGGTGGCGAAGAGGACCAGGACTATGACATCACCAGCTCCACCGAGGTCTGGAGGCC
 AGGCCGGAGGTGGTTCTCCGCAATGACGTGGCACCAACCATCATCCCGACACCCATGTA
 CCGTCTCGGCCAGCCAACCCAGATGAAATCGGCAACTTTATAATTGAGAACCTGAAGG
 CGGCTAACACAGACCCACAGCCCCGCCCTACGACACCCCTCTTGGTGTTGACTATGAG
 GGCAGCGGCTCCGACGCGCGTCCCTGAGCTCCCTCACCTCCTCCGCTCCGACCAAGA
 CCAAGATTACGATTATCTGAACGAGTGGGGCAGCCGTTCAAGAAGCTGGCAGACATGT
 ACGGTGGCGGGGAGGACGACTAGGCGGCCTGCCTGCAGGGCTGGGGACCAACGTCAGG
 CCACAGAGCATCTCCAAGGGGTCTCAGTTCCCCCTTCAGCTGAGGACTTCGGAGCTTGT

Fig. 6

Nucleic acid sequence of ColoUp3
 (SEQ ID NO: 7)

CAGGAAGTGGCCGTAGCAACTTGGCGGAGACAGGCTATGAGTCTGACGTTAGAGTGGT
 GCTTCCTTAGCCTTTCAGGATGGAGGAATGTGGGCAGTTTGACTTCAGCACTGAAAACC
 TCTCCACCTGGGCCAGGGTTGCCTCAGAGGCCAAGTTTCCAGAAGCCTCTTACCTGCCG
 TAAAATGCTCAACCCTGTGTCCTGGGCCTGGGCCTGCTGTGACTGACCTACAGTGGACT
 TTCTCTCTGGAATGGAACCTTCTTAGGCCTCCTGGTGCAACTTAATTTTTTTTTTTAAT
 GCTATCTTCAAAACGTTAGAGAAAGTTCTTCAAAAGTGCAGCCCAGAGCTGCTGGGCCC
 ACTGGCCGTCCTGCATTTCTGGTTTCCAGACCCCAATGCCTCCCATTTCGGATGGATCTC
 TCGTTTTTTATACTGAGTGTGCCTAGGTTGCCCTTATTTTTTTATTTTCCCTGTTGCGT
 TGCTATAGATGAAGGGTGAGGACAATCGTGTATATGTACTAGAACTTTTTTATTAAAGA
 AACTTTTCCCAGAAAAAA

Fig. 6 continued.
 Nucleic acid sequence of ColoUp3
 (SEQ ID NO: 7)

ATGAAGCACCTGAAGCGGTGGTGGTCGGCCGGCGGCGGCCTCCTGCACCTCACCCCTCCT
 GCTGAGCTTGGCGGGGCTCCGCGTAGACCTAGATCTTTACCTGCTGCTGCCGCCGCCCA
 CCCTGCTGCAGGACGAGCTGCTGTTCTTGGGCGGCCCCGGCCAGCTCCGCCTACGCGCTC
 AGCCCCCTTCTCGGCCTCGGGAGGGTGGGGGCGCGCGGGCCACTTGCACCCCAAGGGCCG
 GGAGCTGGACCCTGCCGCGCCGCCGAGGGCCAGCTGCTCCGGGAGGTGCGCGCGCTCG
 GGGTCCCCTTCGTCCCTCGCACCAGCGTGGATGCATGGCTGGTGCACAGCGTGGCTGCC
 GGGAGCGCGGACGAGGCCACGGGCTGCTCGGCGCCGCCGCCGCTCGTCCACCGGAGG
 AGCCGGCGCCAGCGTGGACGGCGGCAGCCAGGCTGTGCAGGGGGGCGGCGGGGACCCCC
 GAGCGGCTCGGAGTGGCCCCCTTGGACGCCGGGGAAGAGGAGAAGGCACCCGCGGAACCG
 ACGGCTCAGGTGCCGGACGCTGGCGGATGTGCGAGCGAGGAGAATGGGGTACTAAGAGA
 AAAGCACGAAGCTGTGGATCATAGTTCCCAGCATGAGGAAAATGAAGAAAGGGTGTGAG
 CCCAGAAGGAGAAGTCACTTCAGCAGAATGATGATGATGAAAACAAAATAGCAGAGAAA
 CCTGACTGGGAGGCAGAAAAGACCACTGAATCTAGAAATGAGAGACATCTGAATGGGAC
 AGATACTTCTTTCTCTCTGGAAGACTTATTCAGTTGCTTTTCATCACAGCCTGAAAATT
 CACTGGAGGGCATCTCATTTGGGAGATATTCCTCTTCCAGGCAGTATCAGTGATGGCATG
 AATTCTTCAGCACATTATCATGTAACTTCAGCCAGGCTATAAGTCAGGATGTGAATCT
 TCATGAGGCCATCTTGCTTTGTCCCAACAATACATTTAGAAGAGATCCAACAGCAAGGA
 CTTTACAGTCACAAGAACCATTTCTGCAGTTAAATTTCTCATACCACCAATCCTGAGCAA
 ACCCTTCTCTGGAAGTAATTTGACAGGATTTCTTTTACCAGGTTGACAATCATATGAGGAA
 TCTAACAAGCCAAGACCTACTGTATGACCTTGACATAAATATATTTGATGAGATAAACT
 TAATGTCATTGGCCACAGAAGACAACTTTGATCCAATCGATGTTTTCTCAGCTTTTTTGAT
 GAACCAGATTCTGATTCTGGCCTTTCTTTTAGATTCAAGTCACAATAATACCTCTGTGAT
 CAAGTCTAATTCCTCTCACTCTGTGTGTGATGAAGGTGCTATAGGTTATTGCACTGACC
 ATGAATCTAGTTCCCATCATGACTTAGAAGGTGCTGTAGGTGGCTACTACCCAGAACCC
 AGTAAGCTTTGTCACTTGGATCAAAGTGATTCTGATTTCCATGGAGATCTTACATTTCA
 ACACGTATTTTATAACCACTTACCACCTTACAGCCAAGTGCACCAGAATCTACTTCTG
 AACCTTTTTCCGTGGCCTGGGAAGTCACAGAAGATAAGGAGTAGATACCTTGAAGACACA
 GATAGAACTTTGAGCCGTGATGAACAGCGTGCTAAAGCTTTGCATATCCCTTTTTCTGT
 AGATGAAATTGTCGGCATGCCTGTTGATTCTTTCAATAGCATGTTAAGTAGATATTATC
 TGACAGACCTACAAGTCTCACTTATCCGTGACATCAGACGAAGAGGGAAAAATAAAGTT
 GCTGCGCAGAACTGTCGTAAACGCAAATTGGACATAATTTTGAATTTAGAAGATGATGT
 ATGTAACTTGCAAGCAAAGAAGGAACTCTTAAGAGAGAGCAAGCACAAATGTAACAAAG
 CTATTAACATAATGAAACAGAACTGCATGACCTTTATCATGATATTTTTAGTAGATTA
 AGAGATGACCAAGGTAGGCCAGTCAATCCCAACCACTATGCTCTCCAGTGTACCCATGA
 TGGAAGTATCTTGATAGTACCCAAAGAACTGGTGGCCTCAGGCCACAAAAGGAAACCC
 AAAAGGGAAAGAGAAAGTGAGAAGAACTGAAGATGGACTCTATTATGTGAAGTAGTAA
 TGTTTCAGAACTGATTATTTGGATCAGAAACCATTTGAACTGCTTCAAGAATTGTATCT
 TTAAGTACTGCTACTTGAATAACTCAGTTAACGCTGTTTTGAAGCTTACATGGACAAAT
 GTTTAGGACTTCAAGATCACACTTGTGGGCAATCTGGGGGAGCCACAACTTTTTCATGAA
 GTGCATTGTATACAAAATTCATAGTTATGTCCAAAGAATAGGTTAACATGAAAACCCAG
 TAAGACTTTCCATCTTGGCAGCCATCCTTTTTAAGAGTAAGTTGGTTACTTCAAAAAGA
 GCAAACACTGGGGATCAAATTATTTTAAGAGGTATTTTCAAGTTTAAATGCAAAATAGCC
 TTATTTTCATTTAGTTTGTAGCACTATAGTGAGCTTTTCAAACACTATTTTAATCTTT
 ATATTTAACTTATAAATTTTGCTTTCTATGGAAATAAATTTTGTATTTGTATTAAAAAA
 AAAAAA

Fig. 7

Nucleic acid sequence of ColoUp4
 (SEQ ID NO: 8)

ATGAAGTTGGAGGTGTTCGTCCCTCGCGCGGCCACGGGGACAAGCAGGGCAGTGACCT
 GGAGGGCGCGGGCGGCAGCGACGCGCCGTCCCCGCTGTCGGCGGCGGGAGACGACTCCC
 TGGGCTCAGATGGGGACTGCGCGGCCAAGCCGTCCGCGGGCGGCGGCCAGAGATACG
 CAGGGCGACGGCGAACAGAGTGCGGGAGGCGGGCCGGGCGCGGAGGAGGCGATCCCGGC
 AGCAGCTGCTGCAGCGGTGGTGGCGGAGGGCGCGGAGGCCGGGGCGGCGGGGCCAGGCG
 CGGGCGGCGCGGGGAGCGGCGAGGGTGCACGCAGCAAGCCATATACGCGGCGGGCCCAAG
 CCCCCTACTCGTACATCGCGCTCATCGCCATGGCCATCCGCGACTCGGCGGGCGGGCG
 CTTGACGCTGGCGGAGATCAACGAGTACCTCATGGGCAAGTTCCCCTTTTTCCGCGGCA
 GCTACACGGGCTGGCGCAACTCCGTGCGCCACAACCTTTTCGCTCAACGACTGCTTCGTC
 AAGGTGCTGCGCGACCCCTCGCGGCCCTGGGGCAAGGACAACCTACTGGATGCTCAACCC
 CAACAGCGAGTACACCTTCGCCGACGGGGTCTTCGCCCGCCGCGCAAGCGCCTCAGCC
 ACCGCGCGCCGGTCCCCGCGCCCGGGCTGCGGCCCCGAGGAGGCCCGGGCCTCCCCGCC
 GCCCCGCCGCCCCGCGCCCGCCGCCCCGGCCTCGCCCCGCATGCGCTCGCCCGCCCGCCA
 GGAGGAGCGCGCCAGCCCCGCGGGCAAGTTCTCCAGCTCCTTCGCCATCGACAGCATCC
 TGCGBAAGCCCTTCGCGAGCCGTGCGCTCAGGGACACGGCCCCCGGGACGACGCTTCAG
 TGGGGCGCCGCGCCCTGCCCGCCGTGCCCCGCTTCCCCGCGCTCCTCCCCGCGGCGCC
 CTGCAGGGCCCTGCTGCCGCTCTGCGCGTACGGCGCGGGCGAGCCGGCGCGGCTGGGCG
 CGCGCGAGGCCGAGGTGCCACCGACCGCGCCGCCCTCCTGCTTGACCTCTCCCGGCG
 GCGGCCCCCGCCAAGCCACTCCGAGGCCCGGCGGCCGGCGCGCGCACCTGTACTGCCC
 CCTGCGGCTGCCCCGAGCCCTGCAGGCGGCCTTAGTCCGNCGTCTGGCCCCGACCTGT
 CGTACCCGGTGGAGACGCTCCTAGCTTGA

Fig. 8
 Nucleic acid sequence of ColoUp5
 (SEQ ID NO: 9)

GGCAGATGAAATATAAGATTCATCAACCACATTTGACAGCCCATGGCAGGTTTCCTGTT
 TTCCATCGTCCCTCTGCAGGTACAGACACACAGAGCCCAGCCGTGGCAGGCTCAGCCG
 GGGTCCGGGGCTGCTAACAACGGCTACATTCCTCCCCAGGGCCAAGGGAAATCCTGAG
 CGCAGGCCAGGGTTGTTTGGTTTTGAGGTGTGCTGGGATGAAAGGCACCCTGGAAGTGG
 AAGGTTTCGGTCATTCATTAATTAATTACATCTATAATTGAGGGTTTGTTCTTAAGAGCG
 AGTCCTTTGAAAGTACTTTCTTCAAACAGTGACTGCCACAAAGGCATCAGATATTCAC
 CACCTTCTCGGCTGCCTCAGCACAGCAAGCTTTATTCTGGGACCTGAGATCCTGTTCTG
 AGCTGGCTTTCCCTTCTCCAGGCTCGCTCACCTCCCTTTAGAGATAGTGGATGGTAAG
 ATGACCAATGCTCAGATTATTCTTCTCATTGACAATGCCAGGATGGCAGTGGATGACTT
 CAACCTCAAGAAATGGAGAAGCATCATGTGCCAAGTGACTTCAATGTCAATGTGAAGGT
 GGATACAGGTCCCAGGGAAGATCTGATTAAGGTCCTGGAGGATATGAGACAAGAATATG
 AGCTTATAATAAAGAAGAAGCATCGAGACTTGGACACTTGGTATAAAGAACAGTCTGCA
 GCCATGTCCCAGGAGGCAGCCAGTCCAGCCACTGTGCAGAGCAGACAAGGTGACATCCA
 CGAACTGAAGCGCACATTCCAGGCCCTGGAGATTGACCTGCAGGCACAGTACAGCACGA
 AATCTGCTTTGGAAAACATGTTATCCGAGACCCAGTCTCGGTACTCCTGCAAGCTCCAG
 GACATGCAAGAGATCATCTCCCACTATGAGGAGGAACTGACGCAGCTACGCCACGAACT
 GGAGCGGCAGAACAAATGAATACCAAGTGCTGCTGGGCATCAAAACCCACCTGGAGAAGG
 AAATCACCACGTACCGACGGCTCCTGGAGGGAGAGAGTGAAGGGACACGGGAAGAATCA
 AAGTCGAGCATGAAAGTGTCTGCAACTCCAAAGATCAAGGCCATAACCCAGGAGACCAT
 CAACGGAAGATTAGTTCTTTGTCAAGTGAATGAAATCCAAAAGCACGCATGAGACCAAT
 GAAAGTTTCCGCCTGTTGTAAATCTATTTTCCCCAAGGAAAGTCCTTGCACAGACAC
 CAGTGAGTGAGTTCTAAAAGATACCTTGGGAATTATCAGACTCAGAACTTTTATTTTT
 TTTTTCTGTAACAGTCTCACCAGACTTCTCATAATGCTCTTAATATATTGCACTTTTCT
 AATCAAAGTGCGAGTTTATGAGGGTAAAGCTCTACTTTCCTACTGCAGCCTTCAGATTC
 TCATCATTTTGCATCTATTTTGTAGCCAATAAACTCCGCACTAGCAAAAAAAAAAAAA

Fig. 9
 Nucleic acid sequence of ColoUp6
 (SEQ ID NO: 10)

TTTTTTTTTTAAAAAAGAGGCTTGGTAAGTTTTTGATGCTTAGTTGACTTTTAGCATT
ATCCAGCATTTGTATTATGAACCAGTGAGTACTGTAATTTTTCTTTCCCTTTCAGAAAG
ACTCAAAGGGAACATATAAATGTTTCCTATTTTAAATGTGGCAATAGTGTAGCTAACAC
TGGTACAGACGGAATAAACACACCTCTAATATTCTCCTGAAGATTTGGTGATCCAGTTT
CAAATAAGGTATGGGAAAAACAGATGTTTTCATTATCGCCACTTAATCCTTACTTCCGA
TTATAATTATACATGTTTGGCTGTAATAACTATACTAAAGCATGCTTGTGAAAGTAGAC
TTCTACAAGGACAGAAAACCCACAACAACAAAGATCGATCACGAAAGACAAGGCATA

Fig. 10
Nucleic acid sequence of ColoUp7
(SEQ ID NO: 11)

CTTTTCTTCCGCACGGTTGGAGGAGGTCGGCTGGTTATCGGGAGTTGGAGGGCTGAGGT
 CGGGAGGGTGGTGTGTACAGAGCTCTAGGACTCACGCACCAGGCCAGTCGCGGATTTTG
 GGCCGAGGCCTGGGTTACAAGCAGCAAGTGC GCGGTTGGGGCCACTGCGAGGCCGTTTT
 AGAAAAC TGTTTAAACAAAGAGCAATTGATGGATAAATCAGGAATAGATTCTCTTGAC
 CATGTGACATCTGATGCTGTGGAAC TTGCAAATCGAAGTGATAACTCTTCTGATAGCAG
 CTTATTTAAAC TCAAGTGTATCCCTTACTCACCTAAAGGGGAGAAAAGAAACCCCATTC
 GAAAATTTGTTCTGACACCTGAAAGTGTTCACGCAAGTGATTCATCAAGTGACTCATCT
 TTTGAACCAATACCAT TGACTATAAAAGCTATTTTGTAAAGATTCAAGAACAGGAAAAA
 GAGATATAAAAAAAGAAAAAGAGGAGGTACCAGCCAACAGGAAGACCACGGGGAAGAC
 CAGAAGGAAGGAGAAATCCTATATACTCACTAATAGATAAGAAGAAACAATTTAGAAGC
 AGAGGATCTGGCTTCCCATTTT TAGAATCAGAGAATGAAAAAACGCACCTTGGAGAAA
 AATTTTAACGTTTGAGCAAGCTGTTGCAAGAGGATTTT TAACTATATTGAAAAGCTGA
 AGTATGAACACCACCTGAAAGAATCATTGAAGCAAATGAATGTTGGTGAAGATTTAGAA
 AATGAAGATTTTGACAGTCGTAGATACAAATTTTGGATGATGATGGATCCATTTCTCC
 TATTGAGGAGTCAACAGCAGAGGATGAGGATGCAACACATCTTGAAGATAACGAATGTG
 ATATCAAATTTGGCAGGGGATAGTTTCATAGTAAGTTCTGAATTCCTGTAAAGACTGAGT
 GTATACTTAGAAGAAGAGGATATTACTGAAGAAGCTGCTTTGTCTAAAAAGAGAGCTAC
 AAAAGCCAAAAATACTGGACAGAGAGGCCTGAAAATGTGACAGGATCATGAATGTCAA
 GGCTTTTATCTTGAGAACATGGTGTCTGGAGTTAAAGGTATTGGCATACTCCACACATC
 TGTACCATTCTTGAGTGATCGCTTAGGAATGAATGTGATTTGAACTCATTCATGTTGAG
 AGGGTGTCAAATTGAGAACCAGGTAGATCCCCACCACCTACAGTAAAAAGGACCCTAAA
 GTAAATTTGGTTGAAGAAATTAGATCCCAAAGATTCTTGGTGAATTTTGAAGTCTTCATC
 AGTATATCCATATTTAAACGAGATGACAGAAGCCAAAGTAATTATGGCAAGTAATGGTT
 TTTATCTTAACTATAAGTTATTTGCTCAAGGGTGTAATGGTCATTACCAAGGCTTTTAG
 AATGCAGTTTCTCATTTGCTGTGGACATGACCATAAAAAAAATTTCCAGTAGGTTTT
 CTATCTGCTACGTTGCTAGCAATCAGCTTATTGGGAACAGTTGATTAACTGTAATAGAA
 ATGCAATACAAATAAAATGTGAACCACATGTGATTTTTCTTTAAAATCAGTGAGATTTG
 AAAATTTCTCCTAGATCTCTTGAATCATGCAAATTTGCTTTGCCTTTATATTGTAACCT
 TGTGGGTTGCTAATAACCAAGCAGTTTGTAGTAGAGTTAACTCAGGCTCGTTCTAGGGA
 CTCATTCATGTTCACTCACTGTACACTCATCTCTGGAAATGTAAAATTTACTTTTATAC
 TATTGTTATGTAGGGCTGACAGGACAAC TGGATCAGTTTCATTAAAAAGGTATGTATGC
 ATTAGAAAAGACATTTGTATGGGTCATTTCAAAGAGGGCTTATGAGGCTGTGAAACCCA
 GAGCTCTTAACGCTGTGACCAAAGATGGAAGTTCTCTATAGGAAGCCATAGCACTCCTA
 ATGTTTGGTGCTATGTTTTCTTGAGGAGATATAAACGTAATAATCCATGATTGTTGCC
 ATGTGAGAGTTTTAAAGGTTAATCAAAATTTCTCTTCTTCAGGGCAAAC TTGAAGATAA
 ATCTTTTGACTCCAGCTCTTTAGAGGATCTAAAGTGACCTTGATGGACAGTGGAAGAAA
 TCACAACATGGAATTCCTCGAATAACAATTTATTGACTTTAAATAATTTTGTCTAATGC
 TACATATACACAATTA AAAACCTTTACACTATTTCTAGAAAGTCAGCATGTATTTTGTG
 GCTCGAAGTTTCTCTAGTGTTTTCTGTGGAAGGAATAAAAATTTGAGTTTCAAAAAAAA
 AAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

Fig. 11
 Nucleic acid sequence of ColoUp8
 (SEQ ID NO: 12)

MGAAGRQDFLFKAMLTISWLTLTCTFPGATSTVAAGCPDQSPPELQPWNPBGHDQDHHVHIG
 QGKTLTLLTSSATVYSIHISEGGKLVIKDHDEPIVLRTRHILIDNGGELHAGSALCPFQG
 NFTIILYGRADEGIQDPYYGLKYIGVGKGGALELHGQKKLSWTFLNKTLHPGGMAEGG
 YFFERSWGHRGVIVHVIDPKSGTVIHSDRFDTYRSKKESERLVQYLNAVDPGRILSVAV
 NDEGSRNLDDMARKAMTKLGSKHFLHLGFRHPWSFLTVMGNPSSSVEDHIEYHGHRSAG
 AARVFKLFQTEHGEYFNVSLSSSEWVQDVETEFWDHDKVSQTKGGEKISDLWKAHPGKI
 CNRPIDIQATTMDGVNLSTEVVYKKGQDYRFACYDRGRACRSYRVRFCLCGKPVPRPKLTV
 TIDTNVNSTIILNLEDNVQSWKPGDTLVIASTDYSMYQAEFEQVLPCRSCAPNQVKVAGK
 PMYLHIGEEIDGVDMRAEVGLLSRNIIVMGEMEDKCYPYRNHICNFFDFDTFGGHIKFA
 LGFKAHLEGTELKHMGGQLVGQYPIHFHLAGDVDERGGYDPPTYIRDLSTHHTFSRCV
 TVHGSNGLLIKDVVGYNLSLGHCFFTEDGPEERNTFDHCLGLLVKSGTLLPSDRDSKMCK
 MITEDSYPGYIPKPRQDCNAVSTFWMANPNNNLINCAAAGSEETGFWFIFHHVPTGPSV
 GMYSPGYSEHIPLGKFYNNRAHSNYRAGMIIDNGVKTTEASAKDKRPFLSIIISARYSPH
 QDADPLKPREPAIIRHFIAYKNQDHGAWLRGGDVWLDSCRFDNGIGLTLASGGTFPYD
 DGSKQEIKNSLFVGESGNVGTMMNDNRIWGPGLDHSGRTLPIGQNFPIRGIQLYDGPI
 NIQNCTFRKFVALEGRHTSALAFRLNNAWQSCPHNNVTGIAFEDVPITSRVFFGEPGPW
 FNQLDMDGDKTSVFHDVDGVSVEYPGSYLTKNNDNLVLRHPDCINVPDWRGAIICSGCYAQ
 MYIQAYKTSNLRMKIKNDFPSHPLYLEGALTRSTHYQQYQPVVTLQKGYTIHWDQTAP
 AELAIWLINFNKGDWIRVGLCYPRGTTFSILSDVHNRLKQTSKTGVFVRTLQMDKVEQ
 SYPGRSHYYWDEDSGLLFLKLKAQNEREKFAFCMKGCEKIKALIPKNAGVSDCTAT
 AYPKFTERAVVDVPMPKKLFGSQLKTKDHFLEVKMESSKQHFFHLWNDFAFIEVDGKKY
 PSSDGIQVVVIDGNQGRVVSHTSFRNSILQGIPWQLFNYVATIPDNSIVLMASKGRYV
 SRGPWTRVLEKLGADRGLKLKEQMAFVGFGKGSFRPIWVTLDTEDEHKAKIFQVVPIPVVK
 KKKL

Fig. 12

Amino acid sequence of full-length ColoUp1 protein
 (SEQ ID NO: 13)

MPPFLLLEAVCVFLFSRVPPSLPLQEVHVSKETIGKISAASKMMWCSAAVDIMFLLDGS
 NSVGKGSFERSKHFAITVCDGLDISPERVRVGAFQFSSTPHLEFPLDSFSTQQEVKARI
 KRMVFKGGRTETELALKYLLHRGLPGGRNASVPQILIIVTDGKSQGDVALPSKQLKERG
 VTVFAVGVRFPWEELHALASEPRGQHVLLAEQVEDATNGLFSTLSSSAICSSATPDCR
 VEAHPCEHRTLEMVREFAGNAPCWGRSRRTLAVLAAHCPFYSWKRVFLTHPATCYRTTC
 PGPCDSQPCQNGGTCVPEGLDGYQCLCPLAFGGEANCALKLSLECRVDLLFLLDSSAGT
 TLDGFLRAKVFKRFVRAVLSEDSRARVGVATYSRELLVAVPVGEYQDVPDLVWSLDGI
 PFRGGPTLTGSALRQAAERGFGSATRTGQDRPRRVVLLTESHSEDEVAGPARHARARE
 LLLLGVGSEAVRAELEETGSPKHVMVYSDPQDLFNQIPELQGKLCSRQRPGCRTCQALD
 LVFMLDTSASVGPENFAQMOSFVRSCALQFEVNPDVTQVGLVVYGSQVQTAFGLDTKPT
 RAAMLRAISQAPYLGGVGSAGTALLHIYDKVMTVQRGARPGVPKAVVVLTGGRGAEDAA
 VPAQKLRRNGISVLVVGVPVLSEGLRRLAGPRDSLIVAAAYADLRYHQDVLI EWLCGE
 AKQPVNLCKPSPCMNEGSCVLQNGSYRCKCRDGEWEGPHCENRFLRRP

Fig. 13

Amino acid sequence of full-length ColoUp2 protein
 (SEQ ID NO: 14)

MRIAVICFCLLGITCAIPVKQADSGSSEEKQLYNKYPDAVATWLNPDPSQKQNLLAPQT
LPSKSNESHDMDDMDEDDDDHVDSQDSIDSNDSDDVDDTDDSHQSDESHHSDESDEL
VTDFPTDLPATEVFTPVVPTVDITYDGRGDSVVYGLRSKSKKFRRPDIQYPDATDEDITS
HMESEELNGAYKAIPVAQDLNAPSDWDSRGKDSYETSQLDDQSAETHSHKQSRLYKRKA
NDESNEHSDVIDSQELSKVSREFHSHEFHSHEDMLVVDPKSKEEDKHLKFRI SHELDSA
SSEVN

Fig. 14
Amino acid sequence of full-length Osteopontin protein
(SEQ ID NO: 15)

MGLPRGPLASLLLLQVCWLQCAASEPCRAVFREA EVTLEAGGAEQEPGQALGKVFMGCP
 GQEPALFSTDND DFTVRNGETVQERRSLKERNPLKIFPSKRILRRHKRDWV VAPISVPE
 NGKGPFPQRLNQLKSNKDRDTKIFYSITGPGADSPPEGVFAVEKETGWLLLLNKPLDREE
 IAKYELFGHAVSENGASVEDPMNISIIIVTDQNDHKPKFTQDTFRGSVLEGVLPGTSVMQ
 VTATDEDDAIYTYNGVVAYSIIHSQEPKDPHDLMFTIHRSTGTISVISSGLDREKVP EYT
 LTIQATDMDGDGSGSTTTAVAVVEILDANDNAPMFDPQKYEAHVPENAVGHEVQRLTVTDL
 DAPNSPAWRATY LIMGGDDGDHFTITTHPESNQGILTRKGLDFEAKNQHTLYVEVTNE
 APFVLKLPTSTATIVVHVEDVNEAPVFVPPSKVVEVQEGIPTGEPVCVYTAEDPDKENQ
 KISYRILRDPAGWLAMPDSGQVTAVGTL DREDEQFVRNNIYEVMLAMDNGSPPTTGT
 GTLLLLTLIDVNDHGPVPEPRQITICNQSPVRQVLNITDKDLS PHTSPFQAQLTDDSDIY
 WTAEVNEEGDTVVL SLKKFLKQDTYDVHLSLSDHGNKEQLTVIRATVCDCHGHVETCPG
 PWKGGF ILPVLGAVLALLFLLLVL LLLVLRKKRKIKEPLLLPEDDTRDNV FYYGEEGGGE
 EDQDYDITQLHRGLEARPEVVL RNDVAPTIIPTPMYRPRPANPDEIGNFIIENLKAANT
 DPTAPPYDTLLVFDYEGSGSDAASLS SLTSSASDQDQDYDYLNEWGSRFKKLADMYGGG
 EDD

Fig. 15

Amino acid sequence of full-length ColoUp3 protein
 (SEQ ID NO: 16)

MKHLKRWWSAGGGLLHLTLLLSLAGLRVDLDLYLLLPPPTLLQDELLFLGGPASSAYAL
SPFSASGGWGRAGHLHPKGRELDPAAPPEGQLLREVRALGVFPVPRTSVDAWLHVSVA
GSADEAHGLLGAAAASSTGGAGASVDGGSQAVQGGGGDPRAARSGPLDAGEEEKAPAE
TAQVPDAGGCASEENGVLREKHEAVDHSSQHEENEERVSAQKENSLLQNDDEENKIAEK
PDWEAEKTTESRNERHLNGTDTSFSLLEDLFQLLSSQPENSLEGISLGDIPLPGSISDGM
NSSAHYHVNFSAISQDVNLHEAILLCPNNTFRRDPTARTSQSQEPFLQLNSHTTNPEQ
TLPGTNLTGFLSPVDNHRNLTSQDLLYDLINIFDEINLMSLATEDNFDPIDVSQFLD
EPDSDSGLSLDSSHNTSVIKSNSSHVCDEGAIGYCTDHESSSHDLEGAVGGYYPEP
SKLCHLDQSDSDFHGDLTQHVFNHTYHLQPTAPESTSEPPFPWPGKSQKIRSRYLED
DRNLSRDEQRAKALHIPFSVDEIVGMPVDSFNSMLSRYYLTDLQVSLIRDIRRGKNKV
AAQNCRKRKLDIILNLEDDVCNLQAKKETLKREQAQCNKAINIMKQKLHDLYHDI FSRL
RDDQGRPVNPNHYALQCTHDGSILIVPKELVASGHKKETQKGKRK

Fig. 16

Amino acid sequence of full-length ColoUp4 protein
(SEQ ID NO: 17)

MKLEVFVPRAAHGDKQGS DLEGAGGS DAPSPLSAAGDDSLGSDGDCAAKPSAGGGARDT
QGDGEQSAGGGPGAEEAI PAAAAA AVVAEGAEAGAAGPGAGGAGSGEGARSKPYTRRPK
PPYSYIALIAMAIRDSAGGRLTLAEINEYLMGKF PFFRGSYTGWRNSVRHNLSLND CFV
KVL RDPSRPWGKDNYWMLNPNSEYTFADGVFRRRRKRLSHRAPVPAPGLRPEEAPGLPA
APPPAPAAPASPRMRSPARQEERASPA GKFSSSFAIDSILRKPFRRRLRDTAPGTTLQ
WGAAPCPPLPAFPALLPAAPCRALLPLCAYGAGEPARLGAREAEVPPTAPPLLLAPLPA
AAPAKPLRGPAAGGAHLYCPLRLPAALQAALVRRPGPHLSYPVETLLA

Fig. 17
Amino acid sequence of full-length ColoUp5 protein
(SEQ ID NO: 18)

MEKHHVPSDFNVNVKVDTGPREDLIKVLEDMRQYELIIKKKHRDLDTWYKEQSAAMSQ
EAASPATVQSRQGDIELKRTFQALEIDLQAQYSTKSALENMLSETQSRYSCKLQDMQE
IISHYEEELTQLRHELERQNNEYQVLLGIKTHLEKEITTYRRLLEGESEGTREESKSSM
KVSATPKIKAITQETINGRLVLCQVNEIQKHA

Fig. 18
Amino acid sequence of full-length ColoUp6 protein
(SEQ ID NO: 19)

MDKSGIDSLDHVTSDAVELANRSDNSSDSSLFKTQCI PYS PKGEKRNPIRK FVRTPE SV
HASDSSSDSSFEP I PLTIKAI FERFKNRKKRYKKKKKRRYQPTGRPRGRPEGRRNPIYS
LIDKKKQFRSRGSGFPFLESENEKNAPWRKILT FEQAVARGFFNYIEKLKYEHLKESL
KQMNVGEDLENE DFD SRRYKFLDDGSI SPIEESTA EDEDATHLEDNECDIKLAGDSFI
VSSEFPVRLSVYLEEEDITEEAALSKKRATKAKNTGQRGLKM

Fig. 19

Amino acid sequence of full-length ColoUp8 protein
(SEQ ID NO: 20)

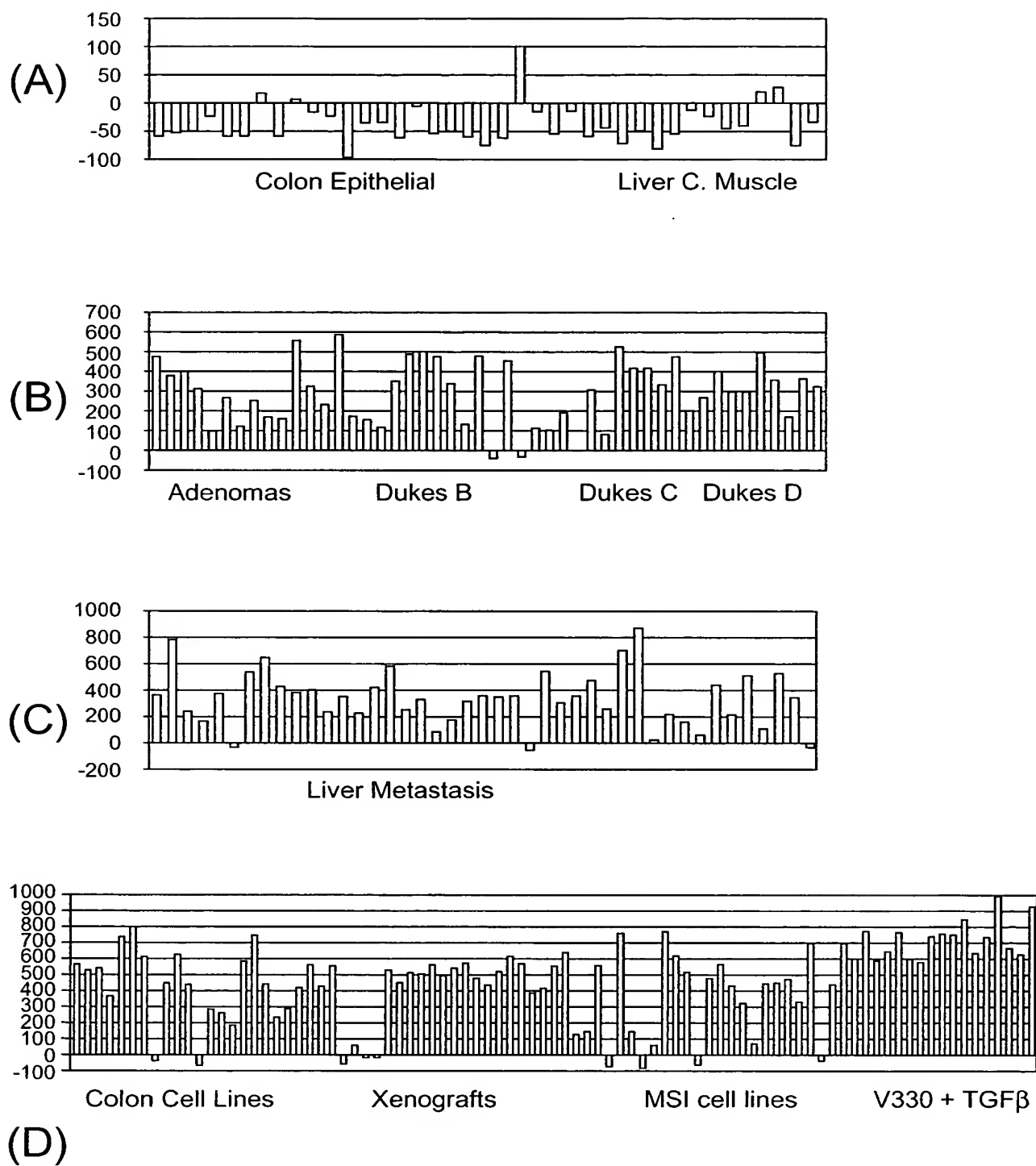


Fig. 20

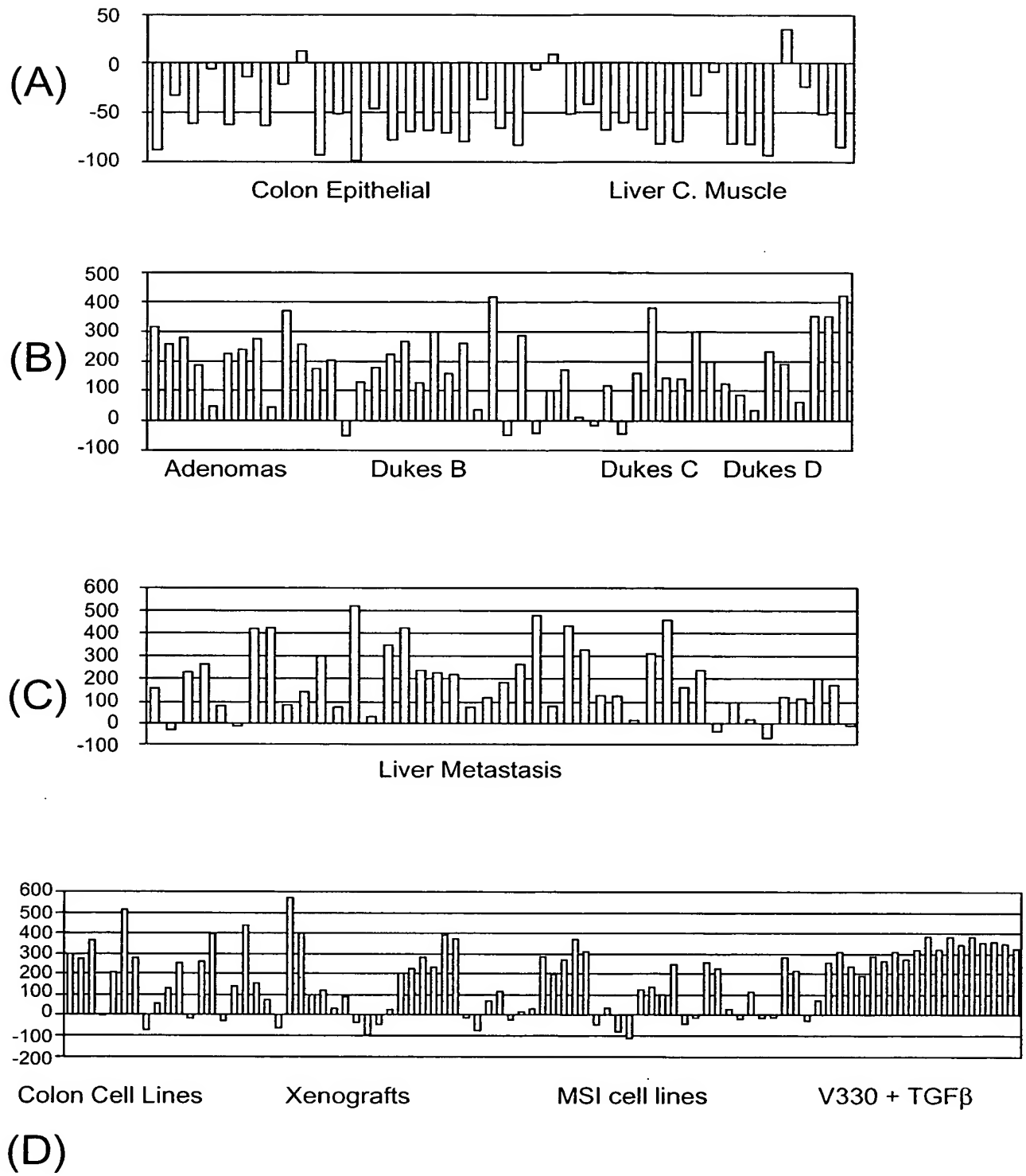


Fig. 21

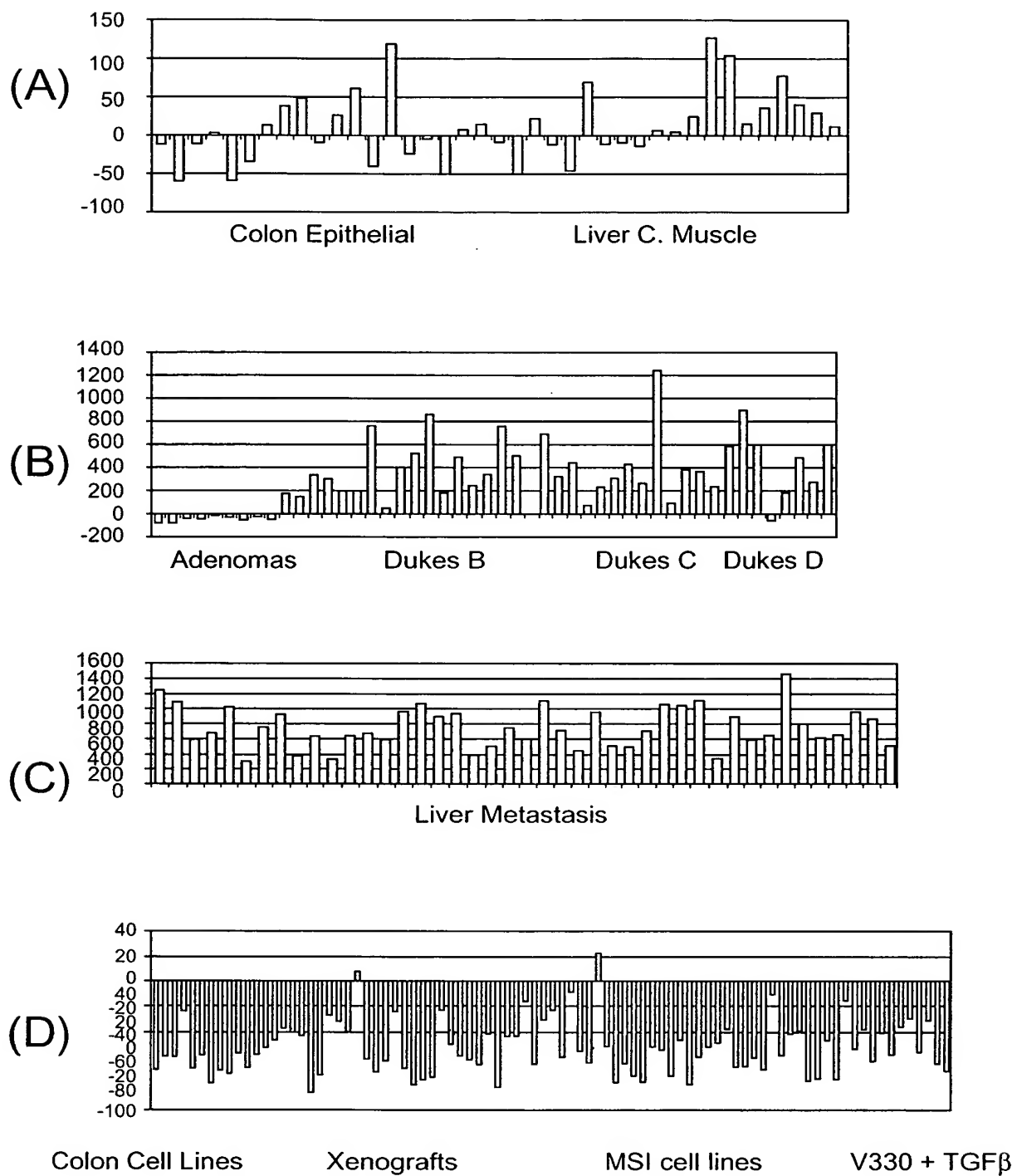


Fig. 22

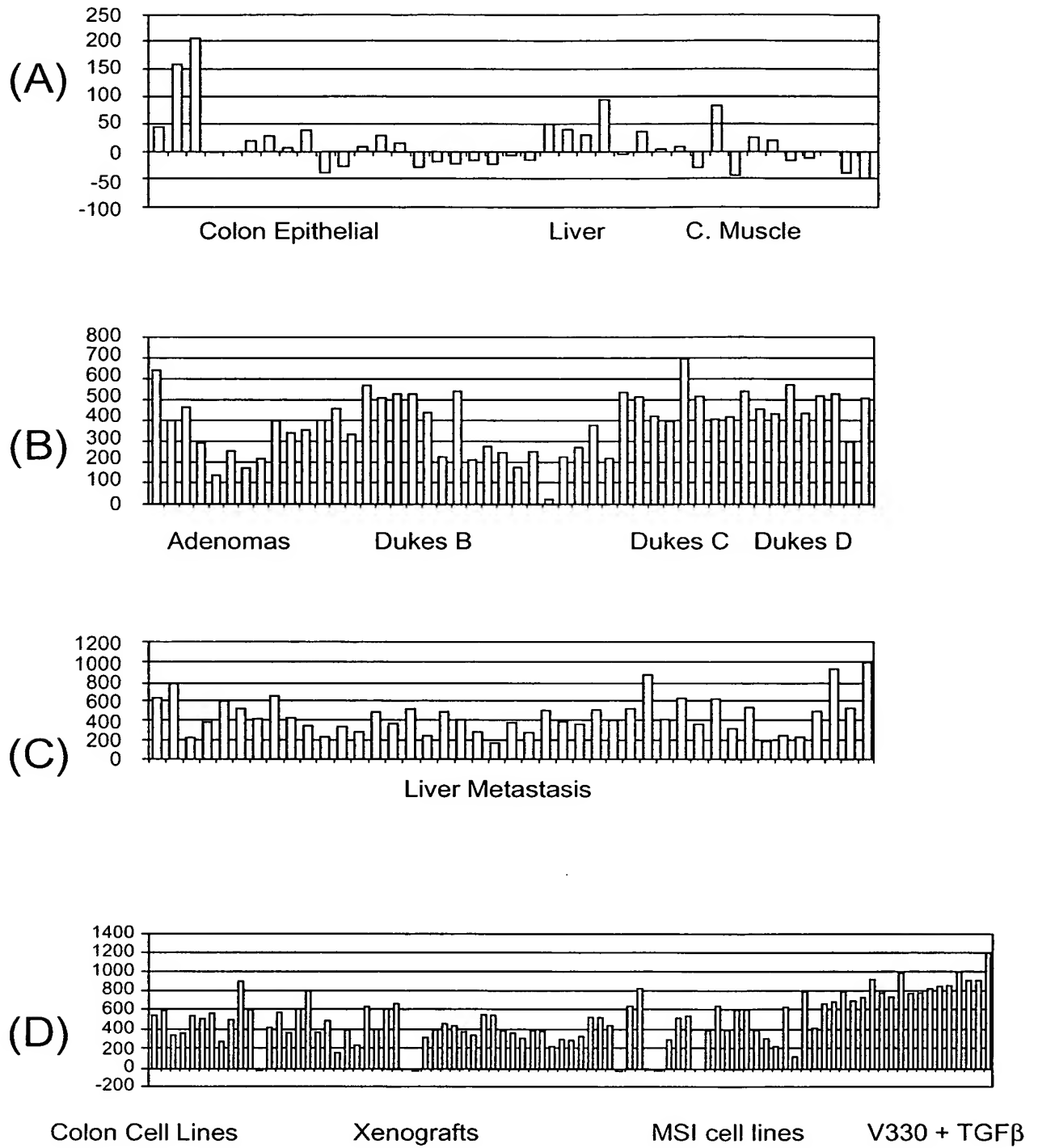


Fig. 23

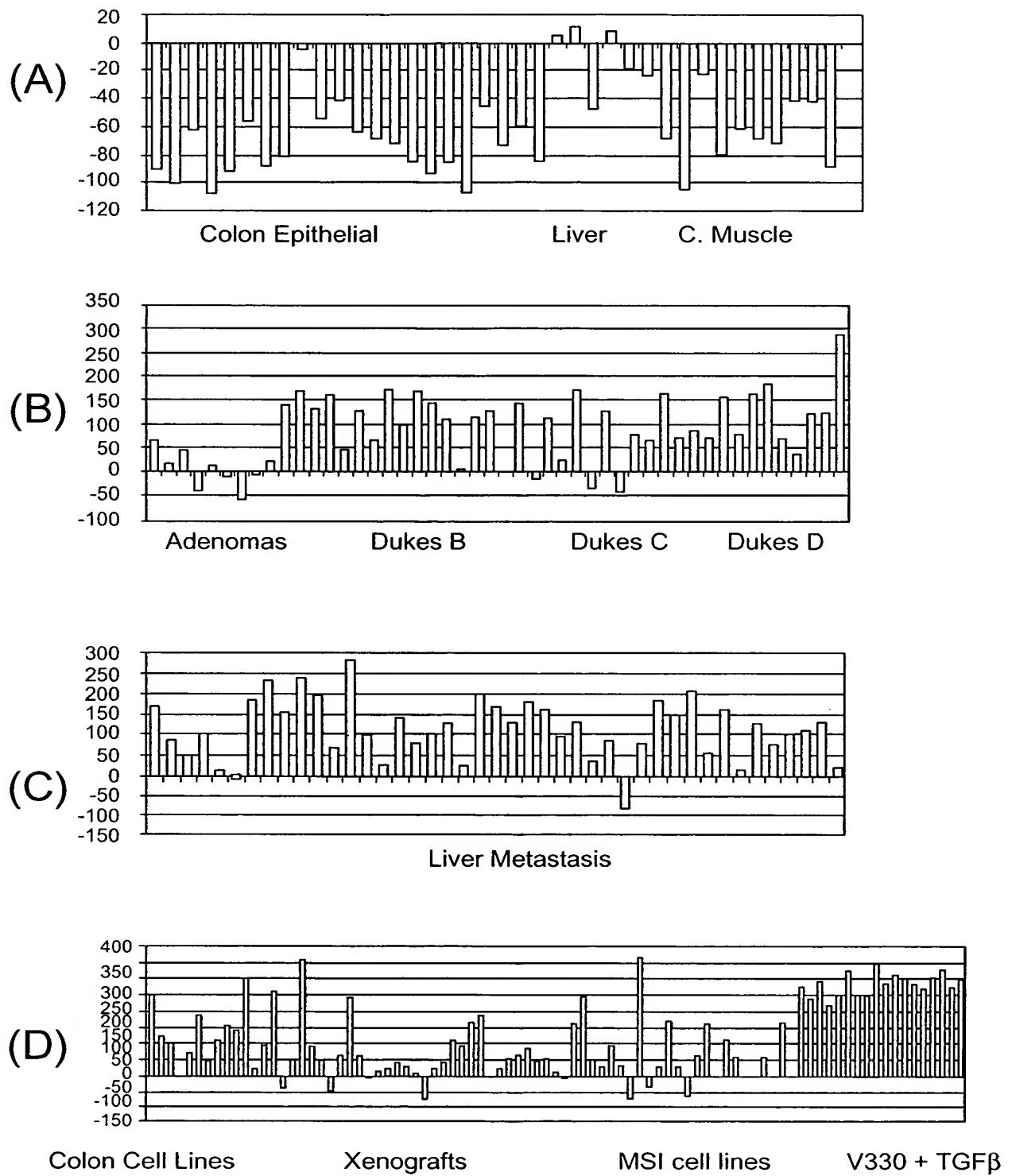


Fig. 24

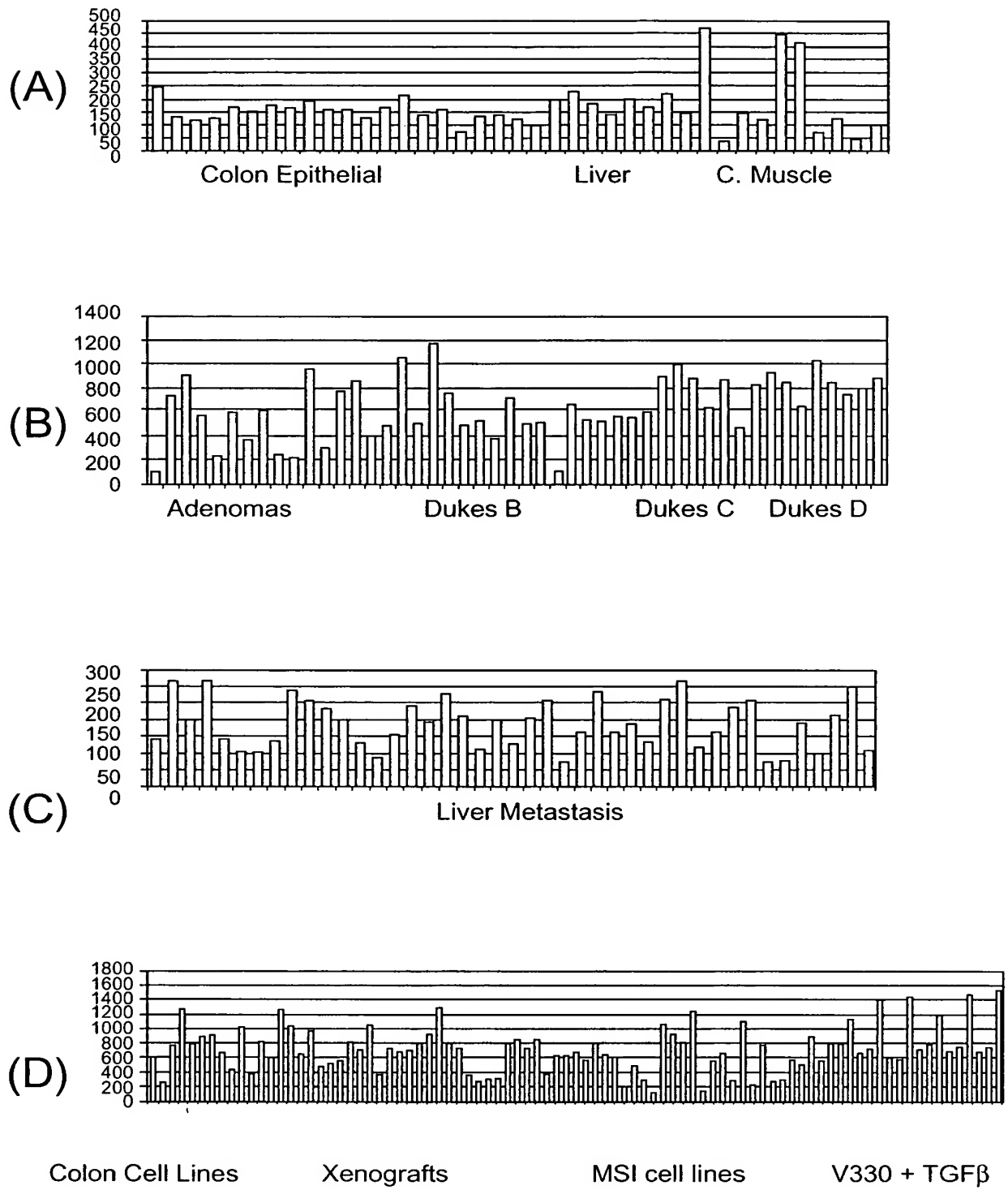


Fig. 25

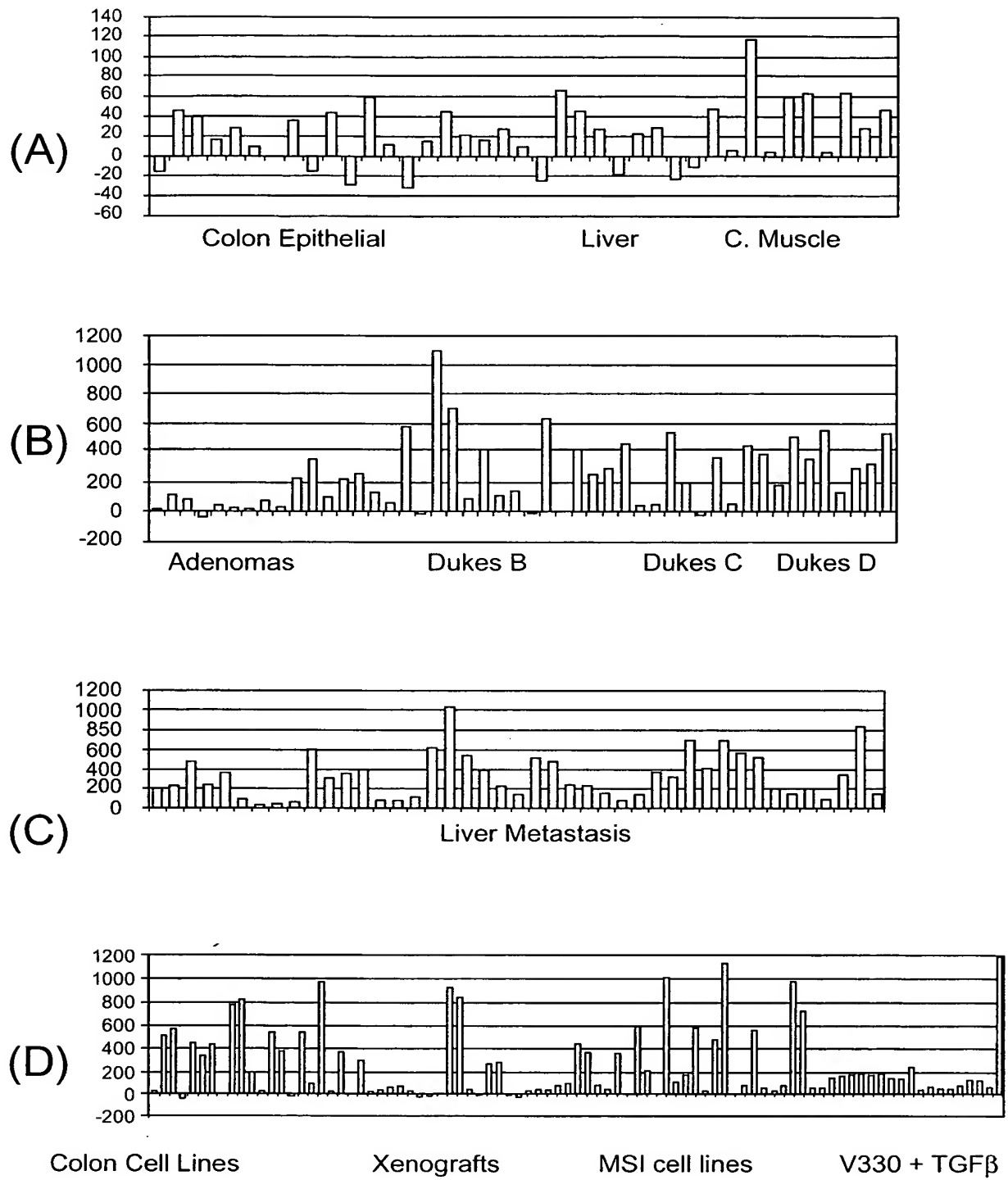


Fig. 26

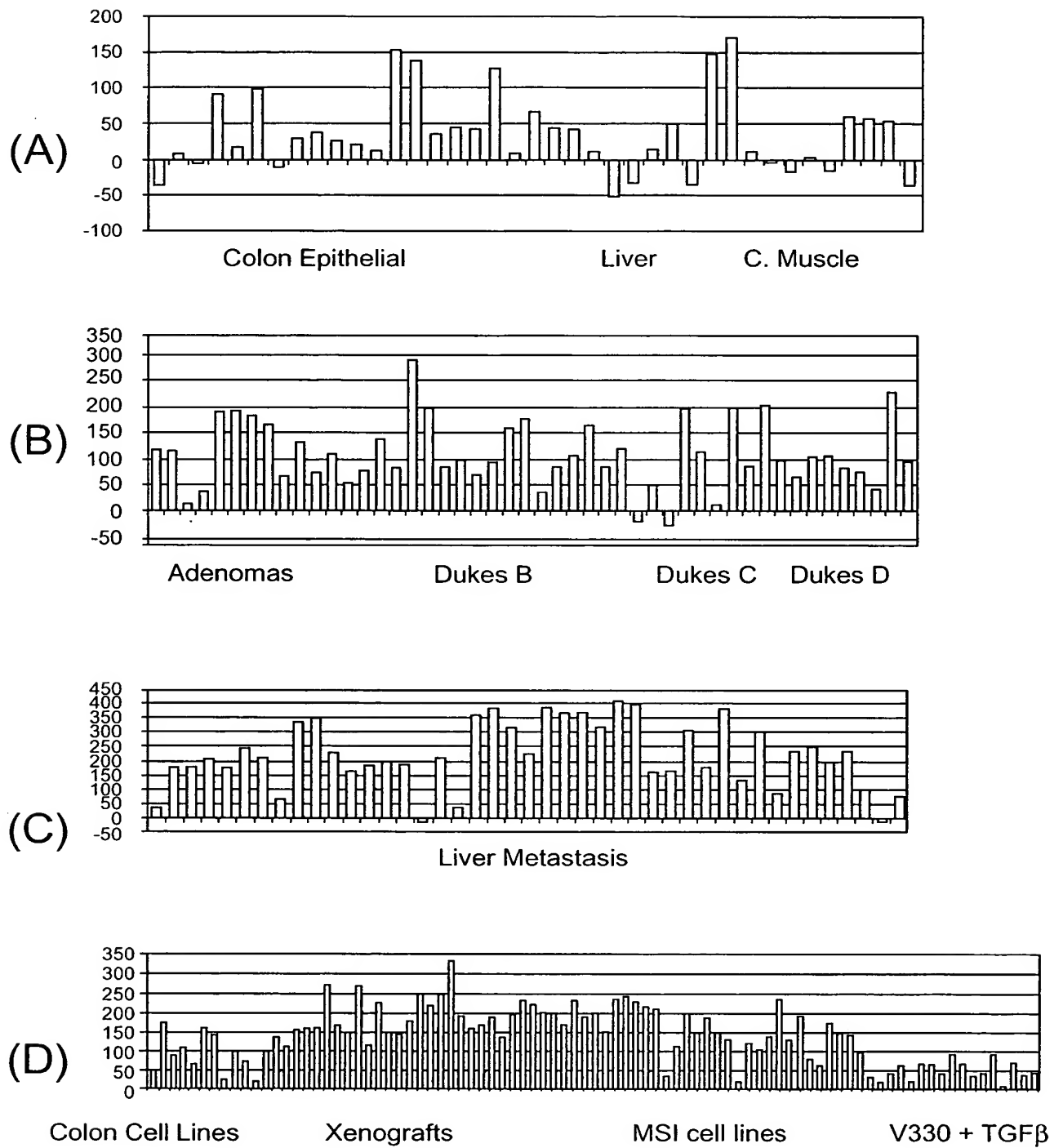


Fig. 27

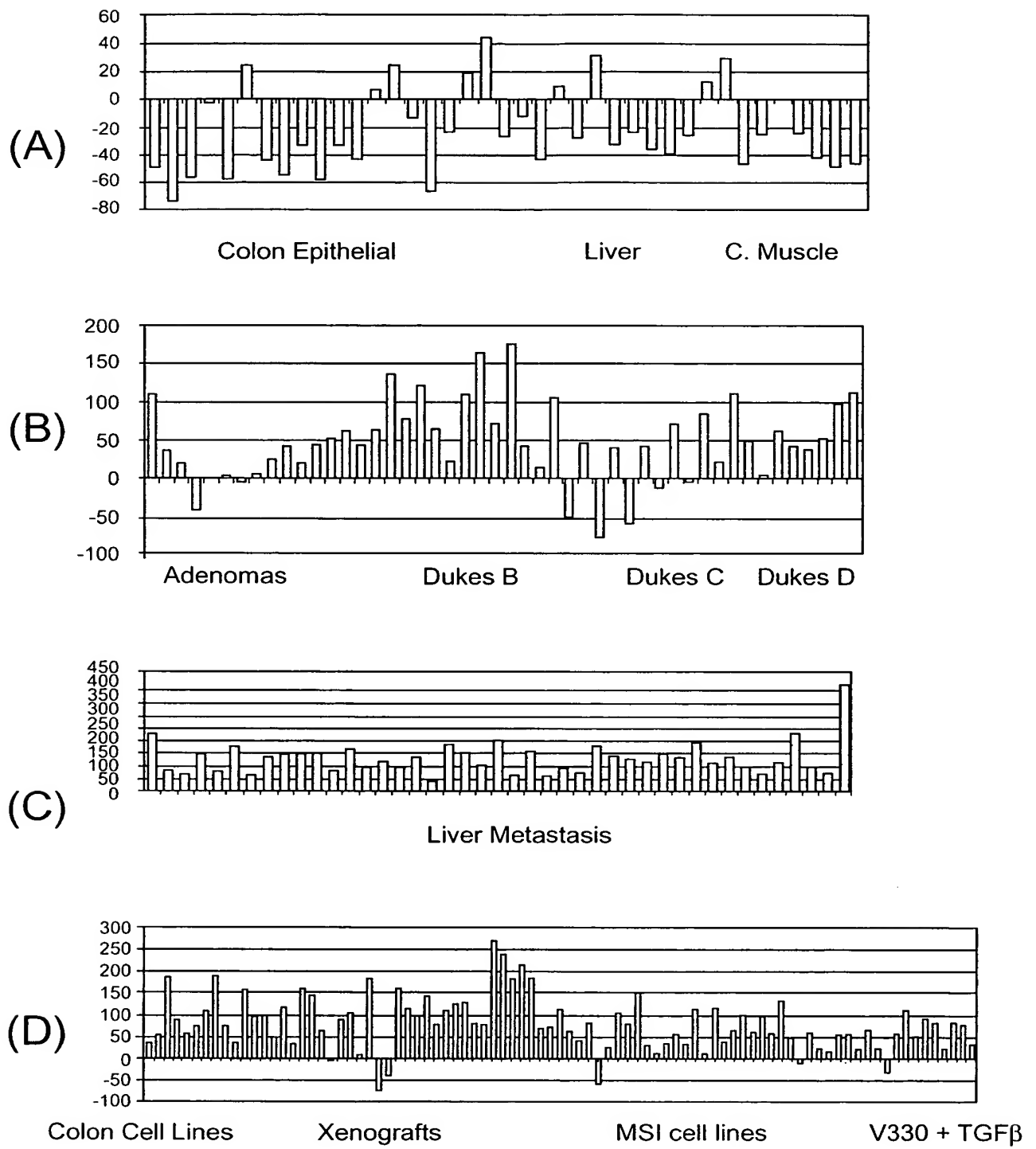


Fig. 28

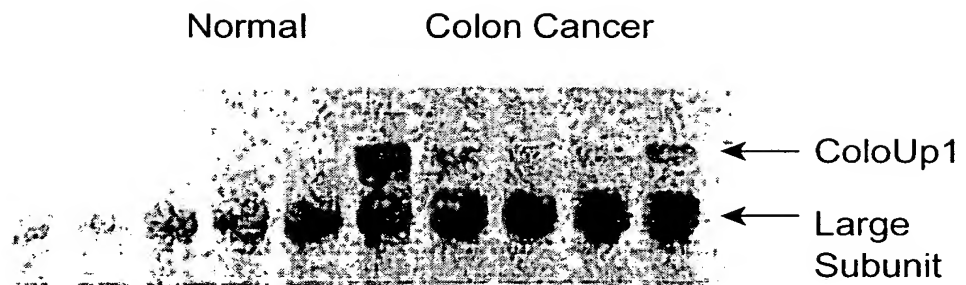


Fig. 29A

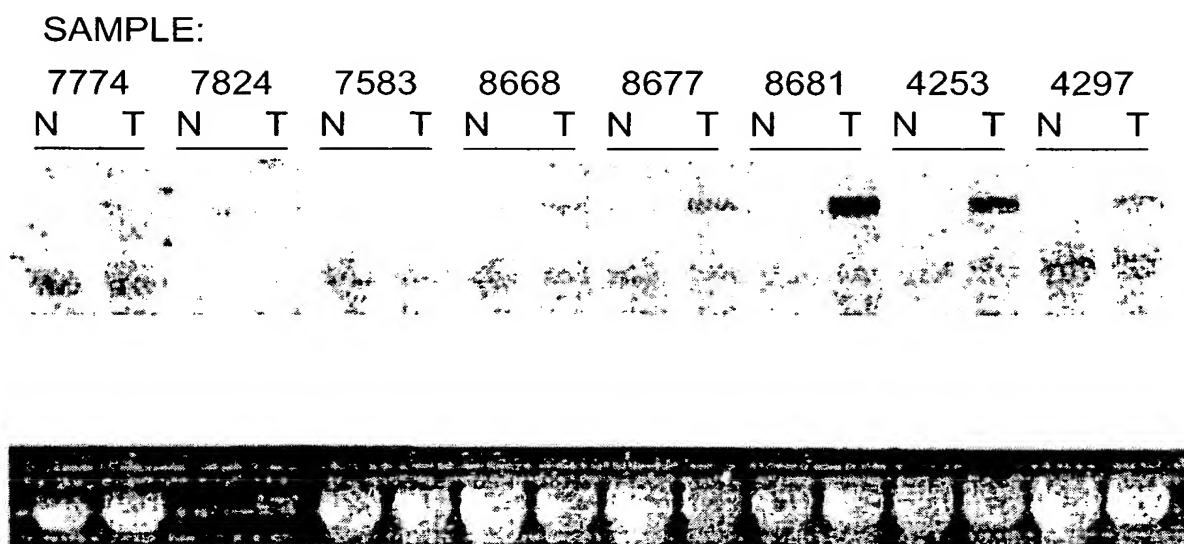


Fig. 29B

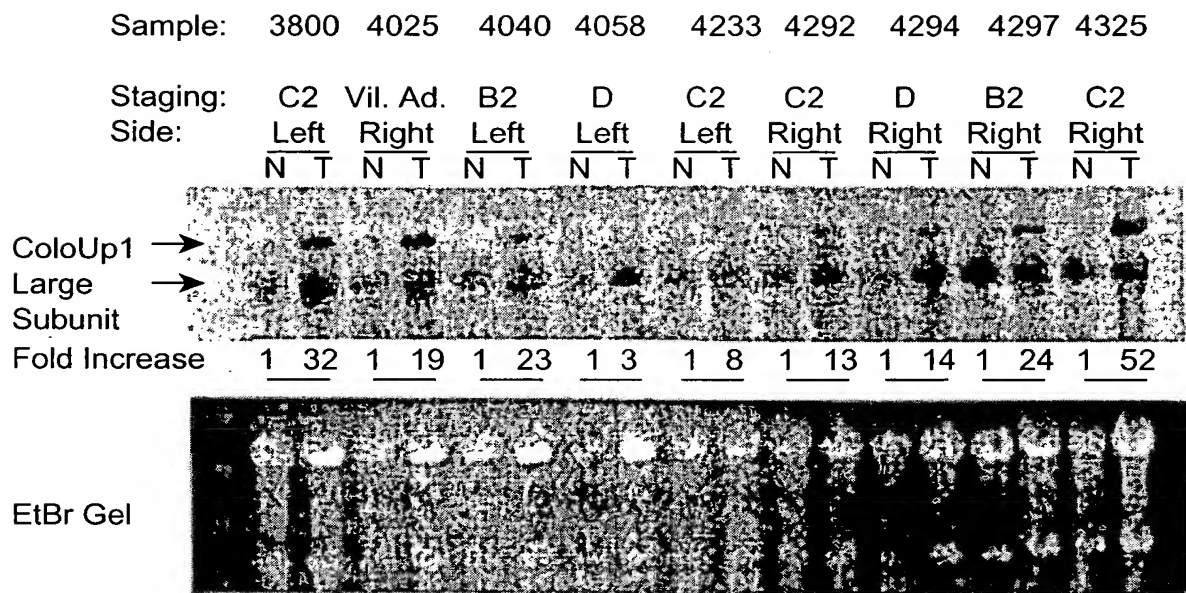


Fig. 29C

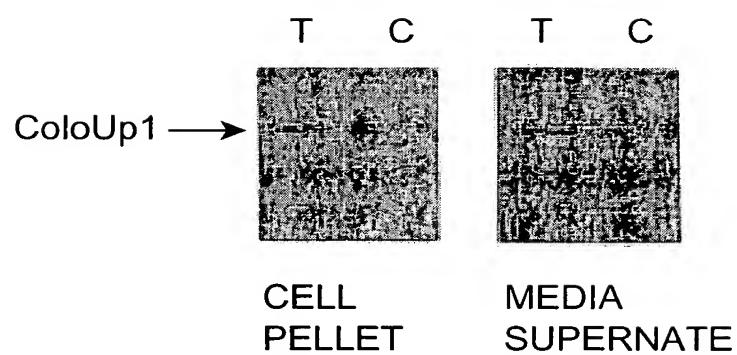


Fig. 30A

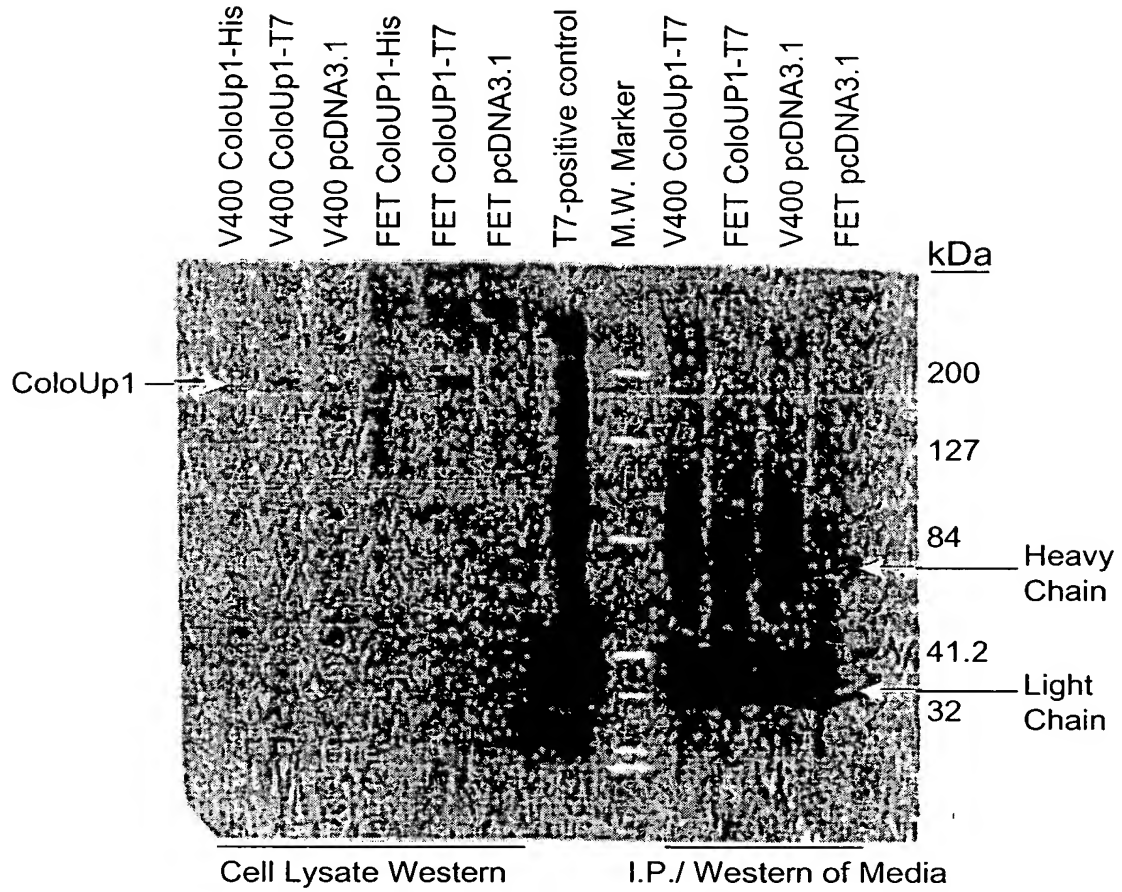


Fig. 30B

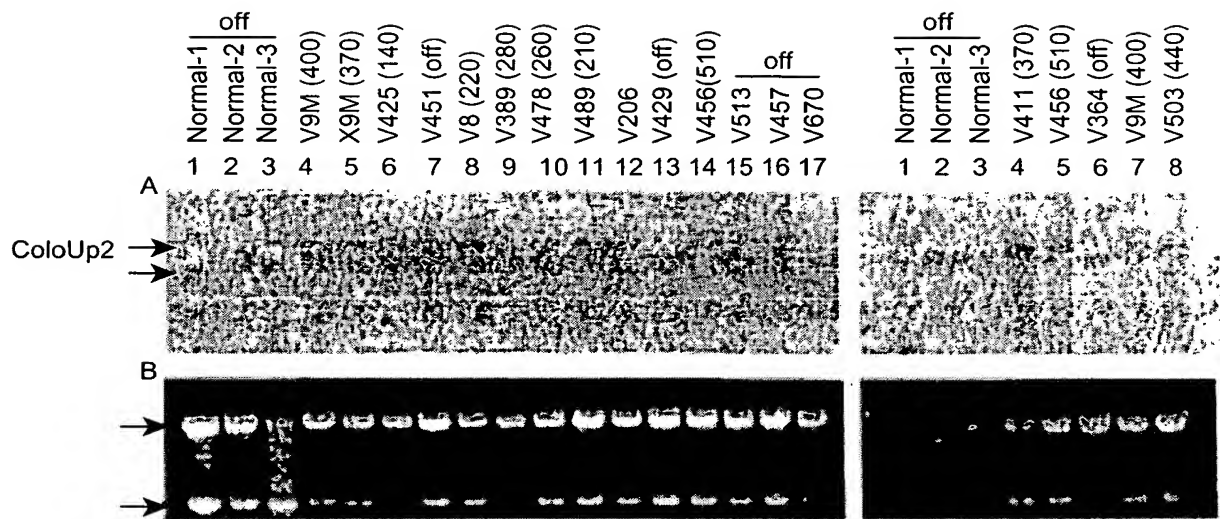


Fig. 31

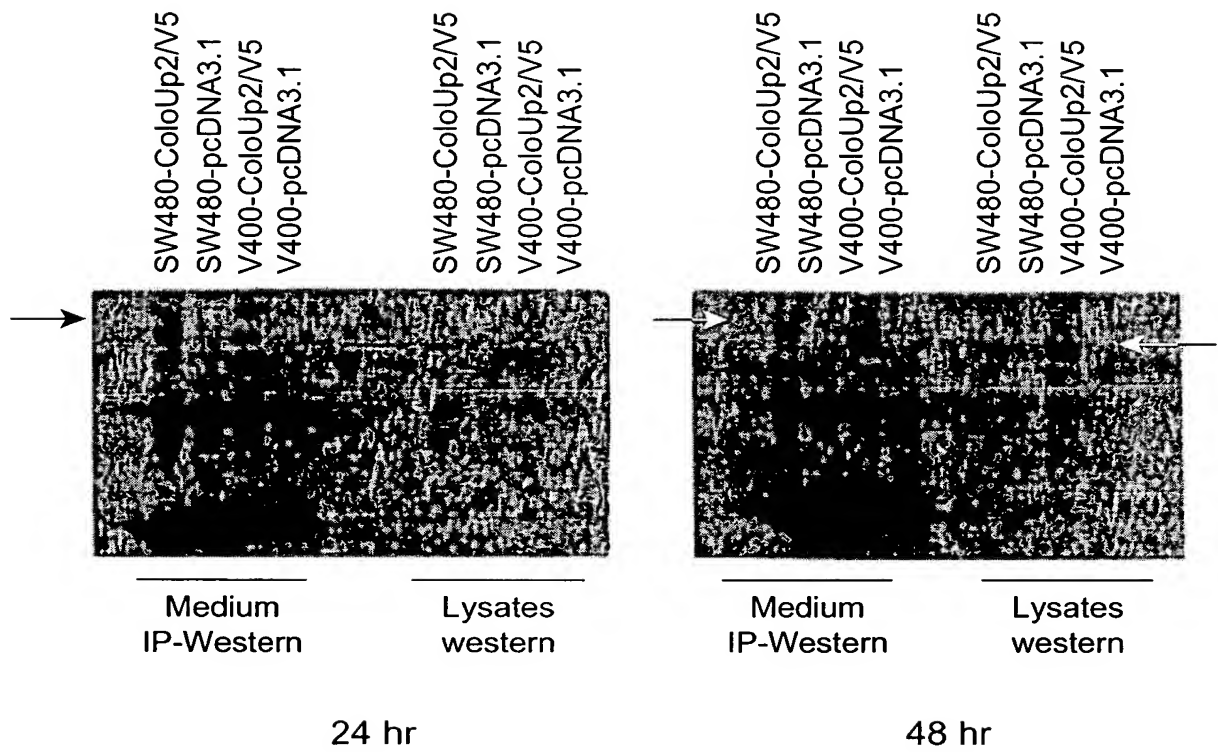


Fig. 32

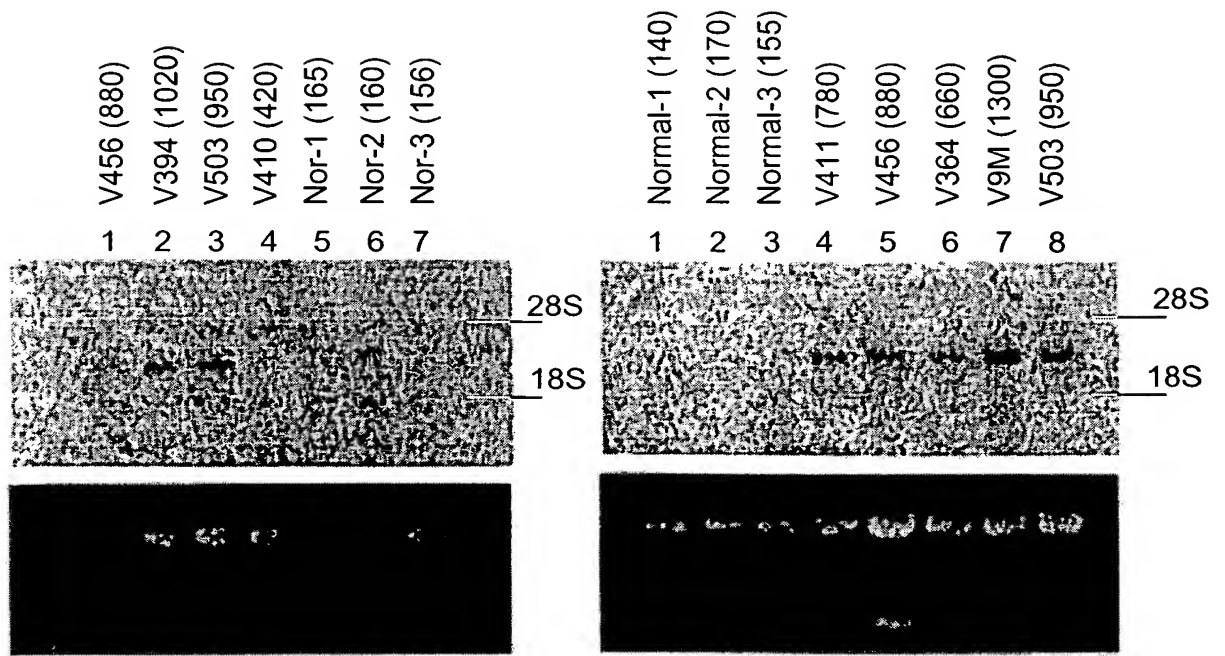


Fig. 33

human foxq1 1 MKLEVFVPRAAHGDKQGSDDLEGAAGSDAPSPLSAAGDDSLGSDGDDGAANSPPAAGGAGRIDT 60
mouse foxq1 1 MKLEVFVPRAAHGDKMGSDLEGAAGSSDAPSPLSAAGDDSLGSDGDDGAANSPPAAGSAGADL 60
rat foxq1 1 MKLEVFAPRAAHGDKMGSDLEGAAGSSDVPSPLSAAGDDSLGSDGDDGAANSPPAAGRGAVDL 60

human foxq1 61 QGDLG-EQSGAGGPGAEAAIPAAAAA AVVAEGAEAGAGPAGGAGGEGARSKPYTRRPK 119
mouse foxq1 61 EGGGERNSSGGPSAQDGP-----EATDDISRTQASAAAGPAGGVGGEGARSKPYTRRPK 115
rat foxq1 61 EGGGERNSSGGASTQDDP-----EVTDDISRTQASPVGPAGSVGGEGARSKPYTRRPK 115

FOX domain

human foxq1 120 PPYSYIALLAMAIRDSAGGRLLTLAEINEYLMGKFPFFFRGSYTGWRNSVRRHNLNLNDCFVK 179
mouse foxq1 116 PPYSYIALLAMAIRDSAGGRLLTLAEINEYLMGKFPFFFRGSYTGWRNSVRRHNLNLNDCFVK 175
rat foxq1 116 PPYSYIALLAMAIRDSAGGRLLTLAEINEYLMGKFPFFFRGSYTGWRNSVRRHNLNLNDCFVK 175

human foxq1 180 VL RDP SRP WGK DNY WML NPN SEY TFADGVFRRRRRKRRLSHRRA PVPA PGLRPEEAPGL PAAP 239
mouse foxq1 176 VL RDP SRP WGK DNY WML NPN SEY TFADGVFRRRRRKRRLSHRRT TVSASGLRPEEAPPGPAGT 235
rat foxq1 176 VL RDP SRP WGK DNY WML NPN SEY TFADGVFRRRRRKRRLSHRRT TVSASGLRPEEAPPGPAGT 235

Putative AD-2

human foxq1 240 P-PPAPAAPASPRMRSPARQEEERASPAKGFSSSF AIDSLRLRKPFRSRRRLRD TAPGITLQWG 298
mouse foxq1 236 PQPAPAAARSSPIARSPARQEEERSSSPASKFSSSF AIDSLRLSKPFRSRRRDGDS ALGVQLPWG 295
rat foxq1 236 PQPAPTAGSSPIARSPARQEEEGSSSPASKFSSSF AIDSLRLSKPFRSRRRDGD PALGVQLPWS 295

human foxq1 299 AAPCPPLPAPFPA L LPAAPCRAL LPLCAYGAGEPARLGLAREAEVPPPTAP P L L L A P L P A A A P 358
mouse foxq1 296 AAPCPPPLRAYPAL LPAAPGGALLPLCAYGAS EPTLLASRGTEVQPAAP - L L L A P L S T A A P 354
rat foxq1 296 AAPCPPPLRAYPAL LPAASGGALLPLCAYGAGEPTLLASRGAEVQPAAP - L L L A P L S T A A P 354

human foxq1 359 AKPLRGPP-AAGGAHLYCPLRLPLPALQAAASVRRRPGPHLPYPVETLLA 403
mouse foxq1 355 AKPFRGPETAGAAHLYCPLRLPLPTALQAAACGPGPHLSYPVETLLA 400
rat foxq1 355 AKPFRGPETAGAAHLYCPLRLPLPTALQAAACGPGPHLSYR VETLLA 400

Fig. 34

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Fig. 35

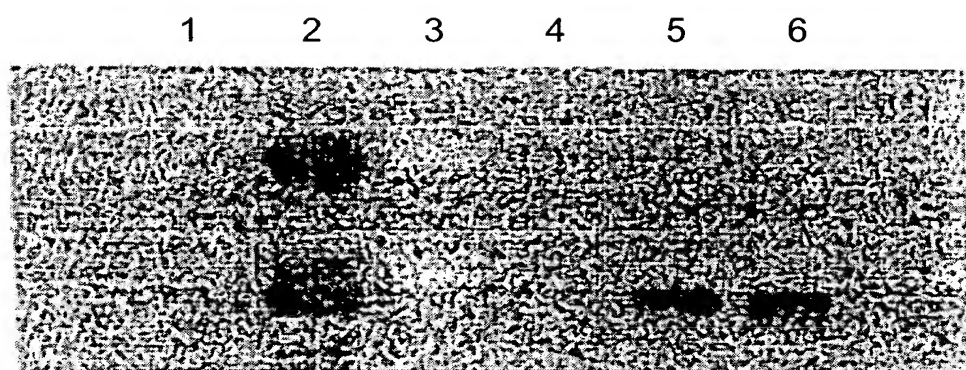


Fig. 36

1 2 3 4 5

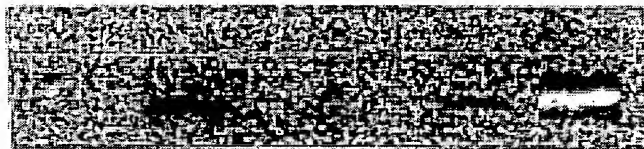


Fig. 37

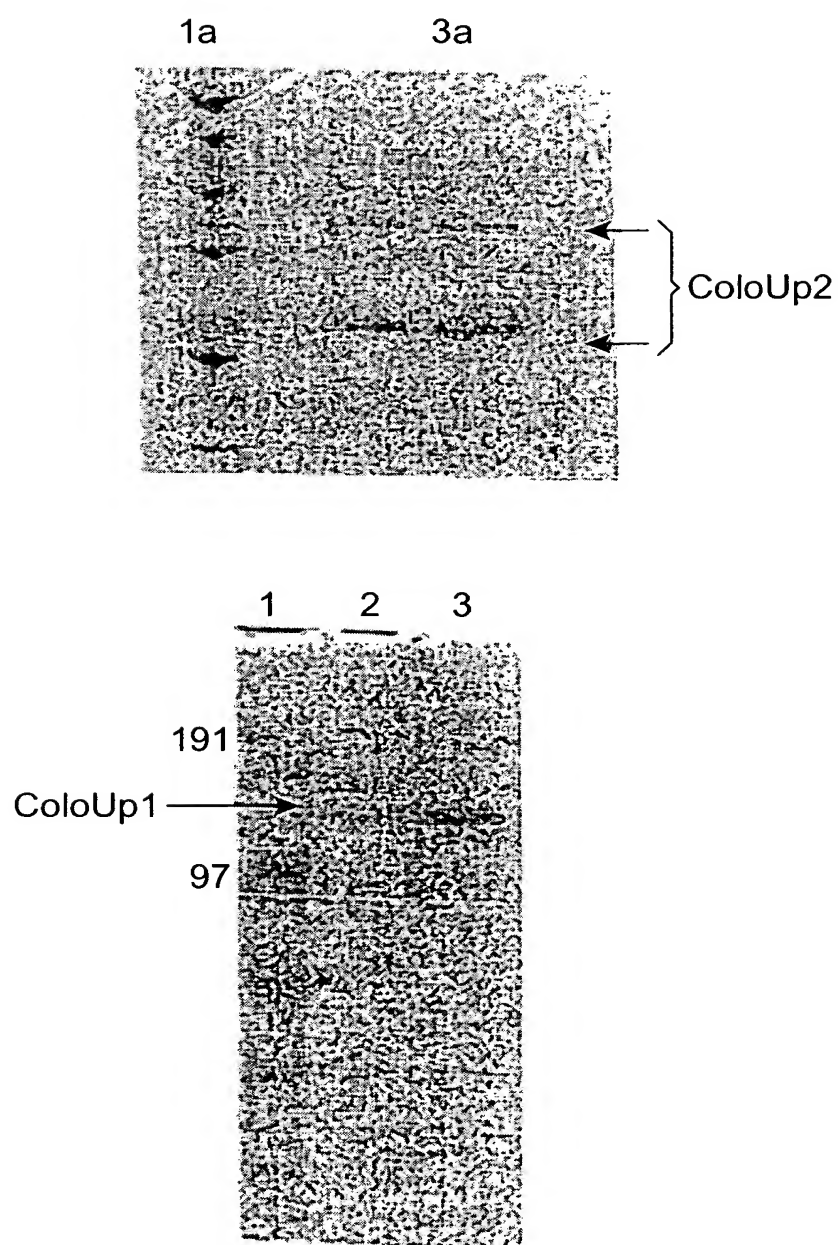
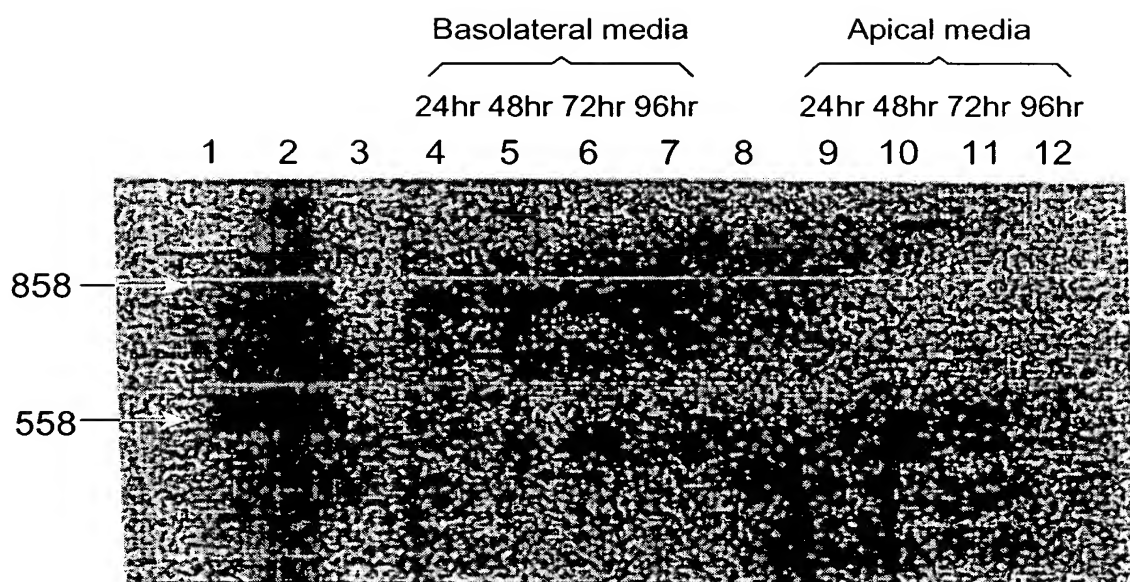
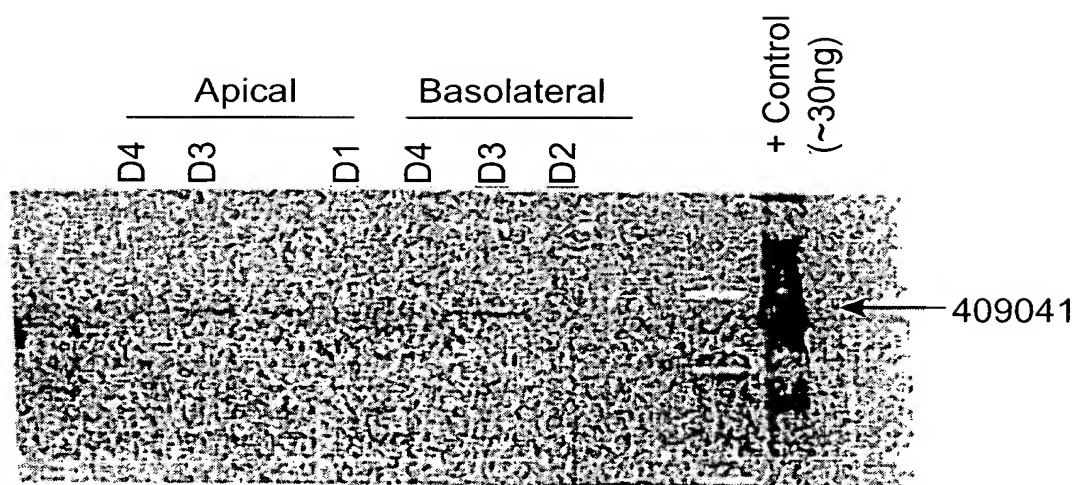


Fig. 38



time points (hr)	resistance	transfection efficiency
0	220	N/A
24	199	15%
48	184	25%
72	220	30%
96	214	30%

Fig. 39



Day	Resistance	% GFP Exp.
0	300	0
1	415	10
2	260	20
3	206	25
4	218	25

Fig. 40

AVLAAHCPFYWKRVFLTHPATCYRTTCPFPPCDSQPCQNGGTCVPEGLDGYQCL
CPLAFGGGEANCALKLSLECRVDLLFLLDSSAGTLDGFLRAKVFVRRFVRAVVLSE
DSRARVGVATYSRELLVAVPVGEYQDVPDLVWSLDGIPFRGGPTLTGSALRQAA
ERGFSGSATRTGQDRPRRVVLLTESHSEDEVAGPARHARARELLLLGVGSWAVR
AELEEITGSPKHVMVYSDPQDLFNQIPELQGKLCSRQRP GCRTQALDLVFMLDTS
ASVGPENFAQM QS FVRSCALQFEVVNPDVTQVGLVVYGSQVQTFFGLDTKPTRA
AMLRAISQAPYLGGVGSAGTALLHIYDKVMTVQRGARPGV PKAVVVL TGGRGA
EDAAVPAQKLRNNGISVLVVG VGPLSEGLRRLAGPRDSL IHVAAYADLRYHQD
VLIEWLCGEAKQPVNLCKPSPCMNEGSCVLQNGSYRCKCRD GWEGPHCENRFL
RRP

Fig. 41
Amino Acid Sequence of a Secreted C-terminal Portion of ColoUp2
(SEQ ID NO:21)